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The Impact Of Computer Based Simulation Training On Leadership Development

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THE IMPACT OF COMPUTER BASED SIMULATION TRAINING ON LEADERSHIP DEVELOPMENT

by

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ABSTRACT

The purpose of this study was to investigate the relationship between measures of emotional intelligence after participation in a simulation based leadership development program as applied to a student cohort at a community college. Additionally, this study was conducted to investigate significant differences in emotional intelligence subscales when compared to the categorical variables of age, race, gender, position type, number of years employed, and time.

All 300 students in the introductory management classes in the Bachelors of Applied Science business principles classes in the Business program were invited to participate. A total of 201 questionnaires representing 103 individuals were returned, garnering a 67% initial return rate; the total number of useable surveys was 182 representing 91 individuals for a final useable return rate of 60.7%.

An analysis of the relationship between the measures of emotional intelligence before and after participating in leadership simulation revealed statistically significant differences after participation in the leadership simulation. There was a significant increase in respondent scores in three of the four subscales after the respondents participated in the Virtual Leader simulation: (a) self-emotion appraisal (SEA), $p = .031$; (b) others emotion appraisal (OEA), $p = .002$; and (c) regulation of emotion (ROE), $p = .002$. The emotional intelligence construct, use of emotion (UOE), $p = .061$, did not demonstrate statistical significance.

A statistical analysis of all combinations and interactions of the categorical variables (age, race, gender, years employed, and position types compared to the value

labeled time) resulted with the effect time as the only statistically significant effect. The label time refers to the difference between respondent scores before and after participation in a leadership simulation. This variable demonstrated a large eta squared value of.473, which suggested a large effect size.

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THE PROBLEM AND ITS CLARIFYING COMPONENTS

Introduction

The nation's community college presidents are facing significant challenges as they move into the 21st century. Enrollments are increasing due to immigration, the baby bounce generation, and an understanding that the jobs of the future will require some level of college education. Generational demographic shifts are changing funding priorities, and lawmakers are demanding accountability and evidence of quality (Baker, 2002; Milliron & de los Santos, 2004). These challenges will accelerate as the baby boom generation ages and becomes preoccupied with eldercare, social security, and retirement.

In the coming decade, large numbers of college presidents and senior administrators are planning to retire. The skills contained in this pool of experienced leaders will be difficult to replace as new, younger, and less experienced leaders grapple with challenges such as increased accountability, changing enrollment demographics, and increased competition for funds. However, a 2001 survey conducted by the American Association of Community Colleges noted that 79% of current community college presidents plan to retire within 10 years and that 33% of responding presidents expected 25% of their senior staff to retire before 2006 (Shults, 2001; Vaughn & Weisman, 2001).

The expected loss of skilled leaders at all levels of the community college system has created a new focus upon leadership training, mentoring, and succession planning (Carroll, 2004). This new focus has been spurred by the increasing technological and organizational complexity of aspects of today's community college. The community

college leader of the future must be able to adapt to a rapidly changing political and technological environment in a way that inspires followers (Lowney, 2003). The development of a leader traditionally includes components of formal academic education, seminar and training experiences, on the job experience, and mentoring (Carroll, 2004). All of these approaches take time and follow the traditional view that leadership is learned through personal and challenging life experiences (Zemke & Zemke, 2001). By some estimates over 80% of leadership development is learned on the job through experience and practice (Zemke & Zemke, 2001).

An emerging option for leadership development is using computer-based simulations (computer games). Computer based simulations are used in a number of high-risk training applications such as pilot, training, military applications, and engineering applications. The use of simulations has been in areas where failure is not an option (Foreman, 2004). Given the pressure community colleges are currently experiencing and the consequences of failure, leadership may be considered another area where failure is not an option. Computer based leadership simulations can allow a leader to experiment with applications and concepts of teamwork and leadership, ethics, or a major shift in an organization's direction in a safe setting (Aldrich, 2003).

Research has been conducted on the learning aspects of computer based leadership simulations and participants' perceptions of effectiveness or actual changes in behavior and beliefs (Faria, 2001). In addition, additional research is ongoing related to behavioral learning and performance that may occur in computer based simulation participants (Faria, 2001).

Statement of the Problem

Influence and relationships are common threads throughout the research and literature on leadership. Effective leaders develop and maintain effective workplace relationships as they influence members toward some common goal. This influence can be directive and autocratic, self directed, or relationally based. Recent leadership research suggests that a relationship-based approach may be the most effective means of leadership (Delahoussye, 2001; Parry, 1998; Pernick, 2001). Many of these relationship building and maintaining skills can be described as components of emotional intelligence. The development of these relationship-building skills can take many years of practice and experience and vary from individual to individual. Recent advances in computer simulations allow potential leaders to practice and rehearse these skills in a context rich environment removed from real life, thus allowing a participant the opportunity to strengthen their skills in a safe environment. Using computer based simulations, leaders have the ability to review performance and potentially modify their real world leadership behaviors. The essential question guiding this research is: Do computer based simulations provide learning experiences leading to behavioral changes in participants' emotional intelligence skills?

Purpose of the Study

The purpose of the proposed study is to examine the relationship between participation in a computer based leadership simulation-training program and the participants' perceived changes in emotional intelligence behaviors. In addition, this

research measured significant differences within the context of current leadership position, length of time employed, age, ethnicity of the respondent, gender, and amount of time participating in the institution's leadership development program.

Definition of Terms

Computer Based Simulation--the technique of replicating a portion of the real world by a computer program. This replication is constructed in such a way to allow the user to be in control and explore the simulated domain.

Emotional Intelligence--the ability to perceive emotion, integrate emotion to facilitate thought, understand emotions, and to regulate emotions to promote personal growth.

Relationship Management--the ability to inspire, influence, and develop others while managing conflict.

Experiential Learning--the process of actively engaging students in an authentic experience that will have benefits and consequences. Students make discoveries and experiment with knowledge themselves instead of hearing or reading about the experiences of others. Students also reflect on their experiences, thus developing new skills, new attitudes, and new theories or ways of thinking.

Leadership--effective attempts to influence others through a process that takes place in groups in which one member influences and controls the behavior of the other members toward some common goal.

Delimitations and Limitations

1. Only employees and students at Daytona Beach Community College were considered in the statistical population.
2. When comparisons were made between pretest and posttest results, only respondent data from both trials were included.
3. This study was focused upon perceptions of emotional intelligence by students at Daytona Beach Community College.
4. The scope of the survey was limited to the number of Daytona Beach Community College students in the sample willing to participate in completing the survey.

Assumptions

1. Students would participate in Virtual Leader training.
2. Respondents would accurately complete a paper survey.
3. The survey questions accurately measured the key elements under consideration.
4. Daytona Beach Community College survey respondents were similar to other American community colleges in regard to statistical population.

Significance of the Study

The history of leadership development has been characterized by numerous theories and approaches over the past 80 years. Traditionally, leadership development has been a combination of classroom based and on-the-job training that requires participants

to practice their newly acquired and developing skills in the workplace. Newer training technologies and a greater understanding of what constitutes effective leadership skills may provide an alternative to on-the job and classroom training.

This research sought to answer the question of whether web-based leadership simulations can be effective in transferring and developing the leadership skills related to emotional intelligence. At the time of the present study, limited research had been conducted related to the effectiveness of web-based leadership simulations in regard to training in emotional intelligence. Through examination and analysis of respondents' perceptions of their pre and post simulation training emotional intelligence ratings, this research sought to enhance existing knowledge in the research area of leadership simulations and skill transfer.

Conceptual Framework

Leadership Defined

What is leadership? While this is a simple question, it is difficult to find a precise definition that has universal acceptance. Bennis stated that leadership is like beauty, "It's hard to define but you know it when you see it" (Bennis, 1994, p. 1). Chemers states that, "Leadership is a process of social influence in which one person is able to enlist the aid and support of others in the accomplishment of a common task" (Chemers, 1997, p. 1). Moreover, Stodgill defined leadership as activities engaged by individuals or group members that significantly contribute to "development and maintenance of role structure and goal direction necessary for effective group performance" (Bass & Stodgill, 1990, p.

411). Bennis, Stodgill, and Chemers spoke to a delicately crafted relationship between leaders and followers and the ability of leaders to influence followers (Stodgill, 1974).

Leadership is a dynamic activity and it is required to adapt to different environments and new challenges. In order to understand leadership theories, a more complete definition of leadership is required. Many of the definitions of leadership are ambiguous; the delineation between leadership and other influence processes is often unclear; and the meaning of leadership often depends on the organizational setting (Barbuto, Fritz, & Marx, 2002).

Conger and Kanungo defined the essential characteristics of leadership as challenging the status quo, engaging in creative visioning for the future of the organization and promoting followers' values, attitudes, and behaviors by using empowering strategies and tactics (Conger & Kanungo, 1998). Early twentieth century studies of leadership concentrated on the qualities or personal attributes of individual leaders. At that time, theorists believed that the essential qualities of leadership were embedded in easily identifiable personal traits and subjective decision. This belief was represented in the studies of Frederick Taylor in the early 1900s and was one of the first leadership approaches to receive scientific study (McCall, 1998; Pearce & Manz, 2005 Stodgill, 1974). Taylor's focus on the mechanics of work and the one best way to do a job brought additional attention to how people actually did those jobs (Davis & Newstrom, 1985).

In these early studies of leader characteristics, there was an attempt to identify the traits that distinguished leaders from other people and the breadth of those differences.

Early leadership studies were concentrated on the qualities that made a leader great and centered on the leader's individual characteristics or traits (Jones & Moser, 2001). It was thought that, by isolating these talents or attributes that contributed to the leader's performance, other leaders could replicate these features to improve their own leadership ability. For example, Tead (1935) thought that the sense of purpose and direction, friendliness, integrity, technical mastery, teaching skill, nervous energy, physical energy, and faith were necessary qualities of leaders. Stodgill, in his studies of leadership traits and behaviors, while not calling for a complete abandonment of trait study, noted that an interactional approach should be considered (Hollander, 1979; House & Aditya, 1997).

Early studies of trait characteristics suffered from two major problems. The first was the lack of substantiated personality theory that could have been used to guide research in the leadership traits. Without this, it was very difficult to replicate trait studies. The second problem was the lack of a developed measurement theory that would lead researchers to use varying operational definitions. A final contributing factor was that situational differences among those being studied were not fully taken into account (House & Aditya, 1997). In spite of these difficulties, a group of categories began to emerge into which leadership could be grouped. These categories focused upon the actions of leaders and their influence over organization and team member performance. While the categories may have changed in definition over time, the essence of these leadership attributes still hold true today (Kirkpatrick & Locke, 1991). Also, as in the past, it is recognized that the situation within which a leader works can change how a leader can or should respond in specific situations (Bass, 1990). The six categories and

groups identified by Kirkpatrick and Locke were (a) capacity (intelligence, originality, judgment); (b) achievement (scholarship, knowledge); (c) responsibility (initiative, confidence, desire to excel); (d) participation (cooperation, humor, adaptability); (e) status (position, popularity); and (f) situation (mental level, needs and interests of followers, objectives).

Trait and situational leadership theories, although different, share the recognition that leaders need to adapt to changing circumstances. Kouzes and Posner (1987), in a study of over 1,500 managers, noted four key leadership qualities: honesty, competency, forward-looking, and inspirational.

Different leadership styles have been identified as a way of explaining how a leader operates to achieve desired outcomes. The use of different styles to explain leadership behavior became popular during the middle of the 20th century as an offshoot of the Hawthorne studies (Roethlisberger & Dickenson, 1939). Elton Mayo's work in the Hawthorne studies demonstrated that money was not an exclusive motivational factor. Instead, he demonstrated that the social environment, now known as the organizational climate, had a more direct impact on worker morale and productivity. The impact of informal work groups had a greater impact on worker motivation, satisfaction, and output (Roethlisberger & Dickenson). The recognition of the impact of informal work and groups and the realization of work as a social process led to the study of effective leadership behaviors in an attempt to identify the style most effective in optimizing work group output (House & Aditya, 1997; Johns & Moser, 2001)

This analysis led to the development of different and often overlapping leadership theories (Johns & Moser, 2001; House & Aditya, 1997). These theories recognized that no single leadership style was best for all circumstances and the approach would need to vary according to the situation (Stodgill, 1974).

Situational leadership approaches were developed as a way to encompass leadership aspects and influences not addressed in the trait and behavior approaches (Fiedler, 1996). Situational leadership considers individual leadership styles, preferences, and the complex organizational drivers influencing those individuals in its approach (Fiedler). Determination of the appropriate leadership style for a given situation is essential for situational leadership to be successful (Frank, 2003; Hersey & Blanchard, 1996).

In 1958, Tannenbaum and Schmidt addressed situational approaches with their continuum of leadership behavior (Tannenbaum & Schmidt, 1973). Hersey and Blanchard's Situational Leadership Model and Fiedler's Contingency Model provided the foundation for much of the leadership research conducted during the 1970s (Hersey & Blanchard, 1981; Rice & Kastenbaum, 1973). These models, in addition to Blake and Mouton's managerial grid, approached leadership as multifaceted, taking into consideration people, personality, and situational context in explaining effective leadership behavior (Hersey & Blanchard, 1982).

House (1996) later expanded upon this interrelationship of leader behaviors and situational influences with the path-goal theory, which primarily focused upon supervisory task and person behaviors. This approach focused upon leader effectiveness

in terms of leaders' relationship with subordinates in providing support and motivation to accomplish organizational goals.

The primary principle of transactional leadership is the concept of an exchange between the leader and the follower. Transactional leadership models try to explain the leader-follower relationships as processes of influence, motivation, and control. The use of rewards and punishments are central to these processes and operate to condition the expected performance. These theories support the concept that behavior can be modified through rewards and punishments (Bass, 2000).

Transactional leadership theories attempt to explain the dynamics of the leader-follower relationship and add the concept of transaction to personal characteristics and leadership styles of effective leaders. These leader-follower exchanges or transactions should be equitable and the relationships between leaders and followers should be defined (Chemers, 1997; Dowd, 1975). This exchange typically has the follower providing a service (usually labor or information) in exchange for a reward. In transactional leadership, this exchange should be mutually beneficial to both parties and the agreement should be entered into willingly and in good faith (Chemers; Dowd).

Leader Development

The activity of influencing people to cooperate toward some desirable goal is the single most important function of a leader (Tead, 1935). Leadership is multifaceted, simultaneously requiring an effective leader to be both directive and structure focused (transactional) and inspirational and visionary (transformational) (Hernez-Broome &

Hughes, 2004). A leader must be sensitive to the situation, acting as a catalyst at the right time to bring the skills of the group together to further the organization's goals (McCall, 1998). The combination of skills and experiences demonstrated by successful leaders are generally acquired through personal skills, training and most importantly, experience (Maxwell, 1993; McCall, 1993; Zemke & Zemke, 2001).

Job experiences are the most commonly occurring leadership development activities. These experiences can be ad hoc or formal with the vast majority of leadership development programs using a combination of these methods (McCall, 1998). Developing a training program that is meaningful to both the participant and the organization is very challenging in both the creation of the training experience and the evaluation of success (Amey, 2005; McCall; Pernick, 2001;).

The wide variation in the types of organizational structures and how work is performed within those structures demonstrates the need for various leadership styles (Amey, 2004; Barker, 2001; Parry, 1998). One perspective is that leadership is a "continual social process" (Barker, p. 471) that is collective and comprehensive, that cannot be examined or improved by extracting discrete components for review.

Leadership and Emotional Intelligence

An attempt was made in The Ohio State University leadership studies of the 1950s to identify specific behavioral indicators of effective leadership. Two factors were isolated that seemed to be more prevalent in effective leaders. These two factors, labeled consideration and initiating structure, identified leadership behaviors grouped around

either structure and organization or consideration for employees' well being (Judge, Piccalo, & Ilies, 2004). More specifically, initiating structure is the extent to which leaders define their and follower roles in well-organized communication channels in pursuit of a goal. Conversely, consideration is focused upon the degree to which a leader shows and expresses respect, concern and consideration for followers and expresses appreciation and support (Judge, Piccalo, & Ilies)

At the same time the Ohio studies were taking place, a similar series of studies were conducted by Michigan State University. While not cited as often as the Ohio State studies, the Michigan State studies also identified task, (structure), relationship-oriented behavior and participative leadership, (consideration) as behavioral indicators of effective leaders (Katz & Kahn, 1952). In this study, it was noted that effective leaders concentrated on both task and their relationships with subordinates in addition to utilizing a participative style to manage at both the group and individual level (Judge, Piccalo, & Ilies, 2004; Katz & Kahn, 1952).

The awareness and practice of consideration behavior is also a characteristic of transformational leaders. Transformational leaders build collective confidence through their ability to build relationships with superiors and subordinates. The behavioral aspects of this relationship building ability include: (a) considering follower needs over their own, (b) projecting this to followers, (c) providing inspiration in a context accepted by followers, (d) providing intellectual stimulation of followers, (e) not publicly ridiculing or criticizing an individual's work, and (f) recognizing and supporting the differences in

each individual's need for achievement and growth (Bass et al. 2003; House & Aditya, 1997; Keller, 2006).

The activities in which leaders engage to build and manage the complex social relationships necessary to be successful could be characterized as components of emotional intelligence. The first use of this term was by Salvovey and Mayer as they attempted to describe an individual's ability to recognize and regulate emotions (Goleman, 2001).

Emotional intelligence was first defined as "a form of intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide ones thinking and actions" (Salovey & Mayer, 1990, p. 63). Their current definition of emotional intelligence, "the ability to perceive emotion, integrate emotion to facilitate thought, understand emotions and regulate emotions and to promote personal growth" (Mayer & Salovey, 1997, p. 101) is more widely accepted. Emotional intelligence can also be described as being aware of or understanding the self and others in relating to people and adapting to varying daily situations (Bar-On, 1997). Currently, there are three separate but related models of emotional intelligence. They are (a) the ability model supported by Salovey and Mayer, (b) the ability and practice model focused upon co-dependent relationship supported by Bar-On, and (c) an applied personality and application model supported by Goleman (Stys & Brown, 2004).

Higher levels of emotional intelligence have been positively correlated with good workplace performance in areas such as, participative management, change management,

putting people at ease, building and mending relationships, self awareness, straightforwardness, and composure (Ruderman, Hannum, & Steed, 2003; Schutte et al., 2001). Many people can cite examples of career derailment due to a person's inability to develop effective workplace relationships or adapt to change. It has been suggested in studies that leaders who lack the ability to understand the emotional states of others or do not feel responsibility to others are likely to fail in the workplace. Lower levels of emotional intelligence exemplified by unawareness of a person's own emotions, inability to handle stress, and erupting into anger easily are also correlated with poor workplace performance (Ruderman, Hannum, & Steed, 2003; Schutte et al, 2003).

It was found in a study on the relationship between transformational leadership, leader emergence, and emotional intelligence that the higher levels of emotional intelligence predicted leader emergence, and was related to transformational leadership (Daus & Ashkanasy, 2005). A positive correlation between high levels of the understanding emotions factor of emotional intelligence and transformational leadership was also found . The results in another study on the relationship between emotional intelligence and transformational leadership of a group of elected officials showed positive relationships between emotional intelligence factors and transformational leadership factors (Barbuto & Burbach, 2006).

Yoder (2003) found, in her study of 100 leaders of large urban community colleges, a positive correlation between the organizational climate and the emotional intelligence competencies of developing others, teamwork and collaboration,

organizational awareness, building bonds, visionary leadership, empathy, respect, and open communication.

Leader Training

Much has been written regarding the importance of experience in developing leaders and leadership skills. However, the real-life pressures of most organizations make it difficult to take the risk that leaders, while learning their skills, will make a critical or expensive mistake (McCall, 1998). Thus, the challenge for an organization attempting to increase the leadership skills of its employees is to decide how much risk it is willing to take while developing these skills (McCall, 1998, 2004).

Classroom-based instruction is the most commonly used form of leadership training, providing a repeatable process to introduce and describe competencies. Despite the relevance and rigor involved in this approach, this form of leadership training does not make a manager competent. A new manager in a leadership role learns how to manage and lead by wrestling with real problems and consequences while coming to the realization that management reality is different from management theory (Hill, 2004; McCall, 1998; Mintzberg, 2004).

This reality includes retribution and punishment in the form of supervisor reprimands and subordinate non-compliance. The ability to make mistakes without fear of retribution and receive support and assistance are important elements for learning. Recent improvements in artificial intelligence engines embedded in simulation games allow customization of game character response levels coupled with near lifelike

character expressions. This combination creates realistic, situationally engaging scenarios that mimic real life experiences (Aldrich, 2002).

Simulation History

One of the first noted uses of games for education and development were the simulation war games of Wei-Hai which were developed in China about 3000 BC (Keys & Wolfe, 1990). Some early examples of the simulations used by the military for training applications are Sparta's war games used by the Prussian military (Bozeman & Wright, 1994). These simulations were used to practice combat skills or to see how an individual would function when placed in invented simulations (Bozeman & Wright). Simulations have also been used in a wide variety of industries as a way to allow individuals to assume roles and practice competencies that would otherwise have to be experienced in real life (Bozeman & Wright; Picket, 1992).

The ability to rehearse strategies and test the status quo is a fundamental driver for the use of simulations (Keys & Wolfe, 1990; Scherpereel, 2005). In the 1950s, Rand Corporation's simulation, Monopologs, was used to simulate the US Air Force industries management supply system. Monopologs was modified by business in order to provide decision-making experience to entry-level managers without delegating real responsibility, thus creating a safe place to make mistakes and gain experience (Faria, 1987; Keys & Wolfe, 1990).

Computer based Simulations and Games

With the advent of the computer age, business simulations quickly began the migration to computer-based delivery. Beginning in the early 1960s, business simulations and games were adapted to mainframe and later PC based computer systems (Keys & Wolfe, 1990; Ng & Ng, 2004). This trend has continued with the application of business games to PC and WEB based systems. The pressures and increasing complexity of today's workplace are placing greater pressure on individuals and organizations to learn and grow as social systems (Kritz, 2003; Ng & Ng).

Computer based simulations provide a myriad of advantages to the user. First, it can allow a user to participate in an immersive experience in smaller blocks of time (Foreman, 2004; Fritz, 2003). Second, computer-based simulation allows a user to test multiple contents and rehearse strategies leading to success. This opportunity to adjust the reality of a simulation to improve outcomes gives the participant the ability to rapidly practice and reinforce successful strategies (Boser, 2002; Foreman). In business situations, one cannot simply "hit the rewind button and start over" when verbal and visual cues are missed. Computer based simulation allows for multiple iterations and permutations of a training exercise (Aldrich, 2002).

Computer based simulations are also familiar to 21st century students who have been reared on a steady diet of computer games (Aldrich, 2002; Boser, 2002; Foreman, 2004). These students have had access to more academic material faster than any other past generation (Foreman). Due to the wealth of computer based and mediated education, students are beginning to participate in individual educational experiences tailored to

their unique preparation and experience (Aldrich; Foreman). The ability to receive information and feedback instantaneously is ingrained in today's student and future business leaders (Delahoussye, Zemke, & Miller, 2001). However, the greatest impact of computer based simulation seems to lie in their ability to help change behavior and beliefs or, in other words, influence the affective domain skills (Adkins; Delahoussye, Zemke, & Miller, 2001; Foreman).

According to Powell (2001), for a simulation to be successful, the following elements must be key components of the design: (a) authentic and relevant scenarios, (b) applied pressure situations that tap users' emotions and force them to act, (c) a sense of unrestricted options and (d) replayability. When applied to the social systems of current organizations, simulations assist participants in developing a greater intuitive understanding of how different factors interact (Adkins, 2004; Foreman, 2004; Powell).

Virtual Leader

Virtual Leader developed by Simulearn Inc. is a computer based leadership simulation game designed to allow participants to practice their relationship building and influence skills in a lifelike game environment. The company advertises this game simulation as "practiceware for people skills" and claims users will make significant improvements in their influence and relationship building skills as the result of participating in the simulation and practicing their new skills (Aldrich, 2004; C. Aldrich, personal communication, March 20, 2006). These people skills which can also be described as being aware of or understanding the self and others in relating to people and

adapting to varying daily situations are congruent with definitions of emotional intelligence and transformational leadership (Bar-On, 1997; Daus & Ashkanasy, 2005).

Students practice and learn skills such as situational awareness, active listening, verbal and nonverbal communication, gain and use of influence, team building and collaboration, motivation and persuasion, influencing group dynamics, empowerment and motivation of others, effective communication, and decision making aligned with strategic business goals. Students can practice these skills by using directive, participative, or delegative decision-making (SimuLearn, 2006). This simulation helps to increase the incidence of the following positive behaviors: (a) treating others as equals, (b) leading others with personal influence, (c) helping others to do better, (d) persuading others towards cooperative efforts, (e) creating achievements, (f) asserting and openly expressing ideas, and (g) expressing positive energy towards results (SimuLearn). For players to be successful in Virtual Leader they must be able to read, correctly interpret, and manage the verbal and non-verbal cues expressed by other participants in the simulation. The cues are influenced by emotion or tension and give participants the ability to practice strategies related to moderating tension to a level conducive to goal attainment (C. Aldrich, personal communication, March 20, 2006; K. Kupersmith, personal communication, January 26, 2006; SimuLearn).

The central premise of Virtual Leader is that the primary mechanism for leadership interaction in organizations is through business meetings. Through meetings, leaders most intensely practice the art of leadership as they influence others to produce the right work to further the goals of the organization (Lowell, 2003). The simulation

focuses upon how interpersonal skills influences leadership effectiveness as a “metaphor for all leadership skills” (C. Aldrich, personal communication, March 20, 2006).

Players in the game practice their situational awareness and begin to learn how to think strategically about how and when to push through ideas, provide information, and promote suggestions. This timing and situational awareness is tempered by verbal and non-verbal expressions of interest and support or non-support by simulation characters. The simulation can be customized in a number of parameters and over 200 body gestures. For example, the verbal and non-verbal expressions of the game characters can be customized to show high or low respect for authority, high or low tolerance for information, and indicate approval or disapproval of an idea either nonverbally (smiling or frowning) or verbally (Aldrich, 2004; Becker, 2004; Hoover, 2005).

This simulated setting focuses upon development and practice of effective people or relationship building skills that are components of emotional intelligence. The same skills of situational awareness, building and mending relationships, self awareness, and straightforwardness and composure which are indicators of high levels of emotional intelligence also must be demonstrated in order to be successful in the Virtual Leader simulation game (Aldrich, 2004; Becker, 2004; Lowell,2003).

Research Questions

This research study will strive to answer the following research questions:

1. How do members of a leadership training or student cohort rate their emotional intelligence skills prior to participation in simulation based leadership training?
2. How do members of a leadership training or student cohort rate their emotional intelligence skills after participating in simulation based leadership training?
3. Is there a statistically significant difference in participants' ratings of their emotional intelligence skills after participating in simulation based leadership training?
4. Is there a statistically significant difference in participants' ratings of their emotional intelligence skills by race, age, years employed, gender, or position type.

Study Design

The researcher received permission from the Senior Vice-President of Academic Affairs to use the Virtual Leader leadership simulation program for the purposes of this study. The researcher was also granted approval by the University of Central Florida's Institutional Review Board to conduct the study (Appendix A).

Virtual Leader participants spent approximately 15 hours in web-based leadership training and discussion of leadership constructs related to emotional intelligence. The college incorporated the Virtual Leader simulation into the leadership development program for the purposes of the study. The Dean of the Bachelor of Applied Science in

Supervision and Management (BAS), and the Dean of Business and Hospitality Programs (BUS) granted permission for the Virtual Leader program to be incorporated as a classroom exercise. Students in these programs spent approximately 15 hours in web-based leadership training and discussion. Additionally, all Virtual Leader simulation participants were given the opportunity to respond to a paper-based questionnaire prior to and after training that measured emotional intelligence in the four separate construct areas. These are (a) self-emotional appraisal (SEA), (b) others emotion appraisal (OEA), (c) use of emotion (UOE), and (d) regulation of emotion (ROE) Wong & Law, 2002). The results of this survey were compared to measure any possible correlation in relationship to participant perceived behavioral changes.

Population and Sample

The students in the Bachelor of Applied Science (BAS) and Business and Hospitality (BUS) programs comprised the population from which participants were drawn. Deans and faculty of these programs identified course sections from which prospective participants were identified. Students were invited to participate by the researcher and the faculty of the BAS and BUS programs. After administration of pre- and post-surveys, a total of 201 questionnaires representing 103 individuals were returned for a return rate of 67%.

Instrumentation

The researcher received permission to use the Wong and Law Emotional Intelligence Scale (WLEIS) developed by Wong and Law of the Chinese University of

Hong Kong. This instrument was developed to establish a psychometrically sound and short measure for use in leadership and management studies. During a class session all students were read and provided an informed consent letter (Appendix B) which was collected by the researcher. After receipt of the informed consent letter, the participants were provided a paper copy of the emotional intelligence questionnaire for completion prior to receiving a copy of the Virtual Leader software (Appendix C). The researcher provided software installation instructions during class sessions and provided e-mail and telephone support to the students electing to participate in the study. After completing the simulation through all levels, the participants were provided with a second paper copy of emotional intelligence questionnaire (Appendix C).

Daytona Beach Community College faculty in the BAS and BUS programs proctored two administrations of the paper-based survey questionnaire. The pre-training and post-training respondent scores for all questions pertaining to each of the key elements were compared to determine any differences.

Data Collection and Analysis

The research study utilized both qualitative and quantitative data. Over 300 students of Daytona Beach Community college were asked to complete the WLEIS questionnaire. The quantitative data in the form of EI pre-test and post-test scores, length of time employed, age, and amount of time participating in the institutions leadership development program were gathered from the answers to the WLEIS questionnaire. Qualitative data in the form of respondent position type, ethnicity of the respondent, and

gender were gathered from the WLEIS questionnaire. All data were analyzed using the Statistical Program for Social Sciences (SPSS) software program. A table is attached as Appendix D that links the survey questions with each of the identified key elements.

The survey data were analyzed using frequency comparisons, paired samples t-tests, and one-way repeated measures analysis of variance (ANOVA). Individual respondent scores were correlated with the following data: respondent position type, time employed, ethnicity, age, and gender. Significance levels at the $p < .05$ were the basis for statistical comparisons.

Organization of the Study

Chapter 1 of this study has been used to develop the framework for the study of the relationship between emotional intelligence and a Web-based leadership simulation. In addition, the research questions which guided this study have been presented. Also addressed was the study methodology including the identification of the sample population, description of instrumentation, and identification of the data collection and analysis methods.

Chapter 2 contains a review of the literature and reviews the evolution of leadership theory, highlighting the transitions from trait theory to transformational leadership. This chapter also explores the concept of emotional intelligence and its relationship to transformational leadership. Finally, leadership-training methods that include web-based simulations are discussed. Chapter 3 is dedicated to detailing the

research methods utilized in the study. It includes the methodology for the administration of the study in addition to a description of the statistical tests utilized to analyze the data gathered for the study. Chapter 4 describes the research study and presents the findings from the research conducted. This includes the WLEIS pre-test and post-test results and the corresponding correlations to the variables examined. Chapter 5 is devoted to a discussion of the results of the research and recommendations for future research that may result from the study.

CHAPTER 2
REVIEW OF THE LITERATURE

Introduction

Most people can describe at least one time during their career that they witnessed or directly experienced leadership success and failure. However, few people can accurately describe the actions of the leader that led to that success or failure. This is because leadership is more the art of influence than the science of management. Chemers states, “leadership is a process of social influence in which one person is able to enlist the aid and support of others in the accomplishment of a common task” (Chemers, 1997, p. 1). Leadership also can be defined as influencing activities engaged in by individuals or group members that significantly contribute to “development and maintenance of role structure and goal direction necessary for effective group performance” (Bass & Stodgill, 1990, p. 411). Bennis, Stodgill, and Chemers speak to a delicately crafted relationship between leaders and followers and the ability of leaders to influence followers (Stodgill, 1974).

Definitions of leadership are often ambiguous; the delineation between leadership and other influence processes is often unclear with the meaning of leadership often depending on the organizational context (Barbuto, Fritz, & Marx, 2002). A common thread in the definitions is the act of influencing change in organizations through dynamic activity and adapting the organization to different environments and new challenges. Conger and Kanungo define the essential characteristics of leadership as challenging the status quo and engaging in creative visioning for the future of the

organization by promoting appropriate followers' values, attitudes, and behaviors using empowering strategies and tactics (Conger & Kanungo, 1998).

Other definitions are more expansive. Hesselbein (2002) defines leadership as a matter of how to be, not how to do it. All three authors speak to what a leader stands for and why leaders act in ways that define that individual. Hesselbein also notes that her definition requires a level of careful introspection that she considers an essential requirement for leaders at all levels (Bennis, 1994; Charan, Drotter & Noel, 2001; Goleman, Boyatzis & McKee, 2002; Maxwell, 1993). In these definitions of leadership, some concepts are repeated. Leadership is about making a difference by creating a vision, challenging the status quo, and energizing others to overcome obstacles. The reality of leadership is that it is complex and dynamic and depends on the environmental and organizational conditions present. The factors of human interaction and complexity mean that no universal approach will succeed in all circumstances. Success in leadership depends on what leaders learn in their careers and how they apply that learning (Amey, 2005).

Leadership Approaches

Over the past 80 years, leadership study has developed along four related and not necessarily exclusive paths. The four theory paths of trait, behavioral, contingency/situational, and reciprocal/integrative are consistent in that leadership is an action involving responsibility and action (Doyle & Smith, 2001). Leadership is not a

passive activity as much as it is an exercise in taking charge and guiding the organization (Conger & Kanungo, 1998).

Trait Approach

Early studies of leadership were focused on the qualities or personal attributes (traits) of individual leaders. Management theorists believed that the essential qualities of leadership could be found in easily identifiable personal traits and subjective decisions. The primary assumption is that leaders were born not made, possessing the unique combination of physical, mental, and social characteristics that made up a leader. The management theories of Frederick Taylor in the early 1900s, which relied upon a dehumanized climate with strict superior-subordinate relationships, were one of the first to receive scientific study (McCall, 1998; Pearce & Manz, 2005; Stodgill, 1974). The belief at that time was that there was the one best way to do a job and one best way to manage people performing those jobs (Davis & Newstrom, 1985).

The identification and classification of traits that distinguished leaders from other people dominated early leadership studies. These studies focused upon the persona that made a leader great and centered upon on a leader's individual characteristics or traits (Jones & Moser, 2001). Researchers theorized that identifying and isolating the talents or attributes that contributed to a leader's performance would lead to replication of those traits to other leaders. Some of the characteristics and traits of leaders identified through studies conducted in the period prior to the 1930s still ring true today. For example, Tead thought that sense of purpose and direction, friendliness, integrity, technical mastery,

teaching skill, nervous energy, physical energy, and faith were necessary qualities of leaders (Tead, 1935). In addition, Stodgill's studies of leadership traits and behaviors expanded the scope of trait study by noting that interactions of traits and situational influencing forces should be considered together (Hollander, 1979; House & Aditya, 1997).

The lack of substantiated personality theory made it difficult for researchers to replicate early studies investigating traits. Additionally the lack of developed measurement theory with specific operational definitions made it difficult to gather psychometric information regarding the trait. The differences in situational context and the degree to which leaders could express themselves in relation to the traits being studied were not fully taken into account. Finally, many of the early leadership studies focused upon supervisors, adolescents, and lower level managers instead of high-level managers and chief executive officers (House & Aditya; 1997).

Through studies conducted in the 1930s through the late 1940s, a group of leader trait and behavior categories began to emerge in which different leadership behaviors could be grouped. The examination of leaders' actions and how leaders project influence over individuals, groups, organizations, and team members was more integrative or interactional in focus. Over time categories may have changed in definition, but the essence of these leadership attributes still hold true today (Kirkpatrick & Locke, 1991). These categories recognize both an interactional approach and the situational context of leadership (Bass, 1990). The six categories and groups are: (a) capacity (intelligence, originality, judgment), (b) achievement (scholarship, knowledge), (c) responsibility

(initiative, confidence, desire to excel), (d) participation (cooperation, humor, adaptability), (e) status (position, popularity), and (f) situation or context.

The recognition that leaders need to adapt to changing circumstances is a common thread between trait and situational leadership theories. Personal attributes continue to be studied by contemporary leadership researchers. Kouzes and Posner (1987), in their study of over 1,500 managers, identified the four leadership qualities of (a) honesty, (b) competency, (c) vision, and (d) inspiration. Other authors such as Bennis and Maxwell also identified similar attributes or qualities. While there is no universal agreement among authors for these qualities, all are very similar. Bennis (1994) identifies six basic ingredients for leaders: (a) guiding vision, (b) passion, (c) integrity (which encompasses knowledge, candor, and maturity), (d) trust, (e) curiosity, and (f) daring.

Bennis also notes that these are traits that can be learned or changed. This is consistent with the current belief that leaders are made and are products of their education, experience, and motivations (Bennis, 1994). John Maxwell has a broader list of 21 qualities, with courage, generosity, servanthood, and teachability being attributes that are unique to other lists. Maxwell's list of qualities also includes traits such as character, charisma, vision, relationships, commitment, and communication (Maxwell, 1993).

The theories outlined earlier exhibit a small sample of the variety of measures that have been used to view leadership characteristics. These characteristics are important because leaders are recognized by the behaviors they exhibit and those behaviors' influence on others. It is essential that leaders have a high level of understanding about

their own leadership traits and characteristics since leadership relies on human interaction, and it is important to understand characteristics of good leadership. It is likely that additional future studies will continue the examination of the personal traits and characteristics of leaders.

Behavioral Approach

The Hawthorne studies marked the opening of new paths of research related to group interaction, leadership styles, and organizational climate. Mayo's work in the Hawthorne studies demonstrated that money was not an exclusive motivational factor, instead he demonstrated that the social environment, now known as the organizational climate, had a more direct impact on worker morale and productivity. In these studies, it was discovered that informal work groups and the related group norms that were established had a greater impact on worker motivation, satisfaction, and output than the lighting levels in the facility (Roethlisberger & Dickenson, 1939). The recognition of the impact of informal work groups and their relationship to organizational climate demonstrated the impact of social interaction in the workplace. The recognition of the impact of social process in the work place led to the study of effective leadership behaviors in an attempt to identify the style most effective in optimizing work group output (House & Aditya, 1997; Johns & Moser, 2001). These theories spurred the development of contingency leadership style theory with the recognition that no single leadership style is best for all circumstances (Stodgill, 1974).

Authoritative and Democratic Leadership

Authoritarian or autocratic leaders are concerned with results and focus on short-term goals. They are most likely to be individual decision makers who take responsibility for their actions and use their powers of coercion and persuasion to achieve results. In some situations, authoritarian leadership is necessary and yields good results; however, the focus on production goals is often at the expense of the group's needs and may be detrimental to long-term organization growth (Charan, Dotter, & Noel, 2001; House & Aditya, 1997; Johns & Moser, 2001).

Democratic leadership involves others in decision-making processes. Unlike the authoritarian leader, consultative and democratic leaders seek views from others in the group. Democratic leaders use their power to set the constraints within which the followers are encouraged to join in deciding what is to be done. One of the main advantages identified with democratic leadership is that it promotes loyalty and commitment in the end (Barker, 2001).

Directive and Participative Leadership

A directive leadership style implies that the leader takes a very active role in both problem solving and decision-making and expects group members to be guided by the leader's decisions. Directive leaders use different strategies including reason, logic, and persuasion to drive acceptance of their goals. Directive leaders generally will make their decisions without consulting others because they believe they have all the information necessary and do not want to spend additional time seeking alternative inputs (Hersey &

Blanchard, 1996; Tannenbaum & Schmidt, 1973; Vroom & Yetton, 1973). Directive leaders use rewards or exert pressure to gain acceptance for their actions.

Participative leaders involve subordinates in discussions, problem-solving and decision-making processes. Consultation occurs individually or as a group, resulting in increased autonomy of workers, power sharing, information sharing and due process. However, participative leaders are still responsible for the final decision. This type of leader remains an active member among equals in the group. Participation is tacitly assumed when subordinates' acceptance, satisfaction, and commitment are important and when subordinates have the required information (Hersey & Blanchard, 1996; Tannenbaum & Schmidt, 1973; Vroom & Yetton, 1973).

Task versus Relationship-Oriented Leadership

Task-oriented leaders are concerned with the group's achievement of goals, valuing performance and productivity as the most important outcome (Hersey & Blanchard, 1996). They use various mechanisms and supervisory layers to ensure that a task is efficiently divided and satisfactorily completed. Task-oriented leaders tend to be psychologically removed from their subordinates (Blake & Mouton, 1978; Wren, 1979). The task-oriented leader may seem to treat employees as machines, to the detriment of their commitment, growth, and morale. However, task-oriented leaders can be the source of expert advice and motivation for subordinates (Bass, 1990).

Relationship-oriented leaders have high concern about building effective relationships and workplace rapport. This leader works to create a workplace that

provides encouragement and mutual support in order to ensure that the goals are achieved. Relationship-oriented leaders contribute to the development of followers and the development of more mature relationships (Blake & Mouton, 1978; Hersey & Blanchard, 1996). The maximum organizational benefits of relationship-oriented leadership occurs when the leader is both highly concerned about production and people while integrating the human and task requirements of the job (Blake & Mouton).

French and Raven, in their work on the dimensions of power and influence in their Power/Interaction Model of Interpersonal Influence, examined power in six different dimensions (French, 1999). They defined six bases of power as "resources that an influencing agent can utilize in changing the beliefs, attitudes, or behaviors of a target" (French, 1999, p.164). These bases were categorized as interaction, coercive, reward, legitimate, expert, reference, and informational. This description of how power and influence are manifested and utilized situationally in organizations spoke to the growing realization that workplace changes are the result of a social influence process (French, 1999).

Fielder's contingency theory provided the opening salvo in the modern belief that there is no one best way to lead. His theory suggested that the effectiveness of both task-oriented and relationship-oriented leaders is contingent on the demands of the situation and that various leader behaviors were effective depending on the situation (Fiedler, 1996; Wren, 1979).

Leadership Theories

Situational Leadership

Situational leadership approaches were developed as a way to encompass leadership aspects and influences not addressed in the trait and behavior approaches (Fiedler, 1996). Situational leadership considers individual leadership styles, preferences, and the complex organizational drivers influencing those individuals in its approach (Fiedler). Determination of the appropriate leadership style for a given situation is essential for situational leadership to be successful (Frank, 2003; Hersey & Blanchard, 1996).

Tannenbaum and Schmidt were the first to address situational approaches in 1958 with their continuum of leadership behavior (Tannenbaum & Schmidt, 1973). Hersey and Blanchard's Situational Leadership Model and Fiedler's Contingency Model were the foundation of much of the leadership research conducted during the 1970s (Hersey & Blanchard, 1981; Rice & Kastenbaum, 1973). These models, in addition to Blake and Mouton's managerial grid, approached leadership as multifaceted, taking into consideration people, personality, and situational context in explaining effective leadership behavior (Hersey & Blanchard, 1982).

House later expanded upon this interrelationship of leader behaviors and situational influences with the path-goal theory which primarily focused upon supervisory task and person behaviors (House, 1996). This approach focused upon leader

effectiveness in terms of their relationship with subordinates in providing support and motivation to accomplish organizational goals (House).

Transactional Leadership

The primary principle of transactional leadership is that of an exchange or transaction between the leader and the follower. Transactional leadership models describe the leader-follower relationship as processes of influence, motivation, and control. Rewards and punishments are significant to these processes and function to condition the expected performance. Transactional leadership theories bolster the concept that behavior can be modified through rewards and punishments (Bass, 2000).

Transactional leadership theories attempt to explain the dynamics of the leader-follower relationship by adding the concept of transaction to personal characteristics and leadership styles of effective leaders. Leader-follower exchanges or transactions should be equitable, and the relationships between leaders and followers should be defined (Chemers, 1997; Dowd, 1975). This exchange typically has the follower providing a service (usually labor or information) in exchange for a reward. In transactional leadership, these exchanges should be mutually beneficial to both parties with the agreement entered into willingly and in good faith. In the early 1970s three main transactional theories gained acceptance (Chemers; Dowd).

First, Homan's Theory of Elementary Social Behavior reinforces the concept of social exchanges between individuals, examining how and why these exchanges maximize rewards and minimize costs. Homan was attempting to define in behavioral

psychology terms what individuals found to be fair in social exchanges, assuming that the group norm had a consensus agreement on what is fair. Taken to its extreme, this concept would lead one to envision an organization full of “calculating schemers” (Dowd, 1975, p. 422). To temper this behavior Homan offers the concept of distributive justice, which is the belief that those rewarded as members of an exchange receive rewards proportionate to their effort (Dowd).

The second theory, which expands upon Homan’s concept of distributive justice, is Thibaut and Kelley’s Theory of Interdependence, which explains why individuals choose to interact in bilaterally discordant relationships. A bilaterally discordant relationship results when one person benefits from the relationship interaction more than another (Chemers, 1997). This theory considers the effect of power and reward anticipation on relationships and the creation of a work atmosphere where individual and organizational goals are mutually reinforcing.

The third theory, Equity Theory, was originally designed to explain motivation when attempting to strike a fair balance between an employee’s inputs and outputs. This theory was extended to leadership theory to explain the assessment of the fairness of exchanges (Chemers, 1997). In equity theory members compare the equity of their efforts and rewards to the efforts and rewards of others. A premise of equity theory is the belief that individuals will vary their efforts and rewards in comparison to others in an attempt to achieve perceived fairness (Chemers).

Another more complex model, Graen’s Dyadic Linkage Model, explains the superior-subordinate dyad that develops in interdependent working relationships and

decision-making. This dyad relationship encompasses the aspects of leader-followership, interdependencies, shared outcomes, and creation of value in relationships (Scandura, Graen, & Novak, 1986). These role-making processes are significant in unstructured or informal tasks where job definitions and standard definitions may not apply, and leader-member exchanges can be very different within the same organization. The challenge for the members is to find the best solution to the particular organizational problem or problems within this complex relationship (Scandura, Graen, & Novak).

Transformational Leadership

Transformational leadership theory builds on the transactional theories and provides a more comprehensive view of leadership through the inclusion of concepts such as mutuality of interests and less reliance on power wielding (Nicholls, 1988). According to Nicholls, transformational leaders attempt to understand the motives of followers and seek to mobilize organizational resources to excite, engage, and captivate followers. Transformational leadership addresses the moral values and higher order needs of followers as identified by Maslow in innovating and changing organizations (Bass, Avolio, Jong, & Berson, 2003; House & Aditya, 1997; Keller 2006).

Transformational leaders create an impression among followers that they have both the competence and the vision to succeed thus creating supportive subordinate behavior (Conger & Kanungo, 1998; House & Aditya, 1997; Keller 2006). Transformational leaders take a personal interest in the long-term development of their employees with the ultimate interest of furthering the organization's goals (Prentice,

1961). Great leaders understand their fellow workers, know them as human beings, and use their tact and skill to encourage them. Transformational leaders are aware of the context of a situation and use their tact and social skills much as an orchestra leader to create vision that captures the imagination of their followers and energizes them in pursuit of a common goal (Conger & Kanungo; House & Aditya; Prentice). Transformational leaders challenge convention to create a new vision of the future eliciting high levels of follower performance and follower self-satisfaction (Burns, 1978; Keller).

It was suggested, in a recent study of leadership styles and their impact on follower development and performance in the Israel Defense Forces (IDF), that transformational leadership contributes to high performance by followers. Cadets were trained in either the specialized transformational leadership training or the standard eclectic leadership training process. Their followers' (platoon) performance was evaluated after the cadets were promoted to platoon leaders. In comparing platoon performance categories, the platoons of the platoon leaders who received training in transformational leadership preformed at a consistently higher level than the non-transformational trained leaders (Dvir, Eden, Avolio, & Shamir, 2002).

The most commonly recognized type of transformational leader is the charismatic leader. Although the differences are relatively minor, most people can identify transformational leadership by describing the characteristics of charismatic leaders (Keller, 2006; Muldoon, 2004). These leaders can be constructive such as Martin Luther King and Mahatma Ghandi, or destructive such as Vladimar Lenin and Adolf Hitler

(House & Aditya, 1997; Keller 2006). Charismatic leaders have strong personal characteristics of self-confidence, dominance, and a strong conviction of moral righteousness. They are perceived as agents for radical change who can articulate a vision that energizes followers (House & Aditya).

The concept of serving others has started to emerge in the recent leadership literature. Greenleaf first coined the "value driven and performance orientated" term "servant-leadership" in 1970 (Bass, 2000, p. 32). Greenleaf's central premise is:

> The servant leader is servant first, . . . It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead . . . . The difference manifests itself in the care taken by the servant--first to make sure that other people's highest--priority needs are being served. The best test, and the most difficult to administer, is: Do those served grow as persons? Do they, while being served become healthier, wiser, freer, more autonomous, more likely themselves to become servants? And what is the effect on the least privileged in society; will they benefit or, at least, not be further deprived. (Greenleaf, 1996, pp. 13-14)

Servant leadership emphasizes trust, selflessness, and collaboration coupled with a keen desire to help others. This leader makes a deliberate decision to exercise ethical leadership in the service of others not for the accumulation of power (Farling, Stone, & Winston, 1999). Greenleaf's concept of servant-leadership does not rely upon a traditional command and control structure. Instead, it is focused upon the development of individuals to promote personal growth and teamwork (Farling, Stone, & Winston; Raelin, 2005).

Leader Development

Leadership is multifaceted, simultaneously requiring an effective leader to be both directive and structure-focused (transactional) and inspirational and visionary (transformational) (Hernez-Broome & Hughes, 2004). Effective leaders have the skill to recognize a situation for what it is and change their leadership style accordingly. This combination of situational awareness, knowledge of individuals' skills, and the wisdom to act as a catalyst in an appropriate manner to further the organization's goals is the mark of an effective leader (McCall, 1998). This combination of skill, experience, and wisdom demonstrated by successful leaders historically has been developed through training, and most importantly, experience (Maxwell, 1993; McCall; Zemke & Zemke, 2001).

On the job training and experiences are where most leaders receive their initial training and development. This development can be ad hoc or formal with the vast majority of leadership development programs using a combination of methods (McCall, 1998). The creation of realistic classroom-based leadership development training that is meaningful to both the participant and the organization is very challenging in both the creation of the training experience and the evaluation of success (Amey, 2005; McCall; Pernick, 2001). All too often leadership training, while describing the leadership issue fails to recreate the situational and strategic context for the participant (Amey; McCall; Pernick)

Leadership skills and qualities are universal. DeVries (2003) identified the following leadership skills as important for all organizations:

1. Have a compelling vision that speaks to the collective imagination.
2. Develop a creative strategy responsive to enemy strengths.
3. Model excellence.,
4. Create a well-rounded executive constellation.
5. Encourage innovation.
6. Manage meaning to foster group identification.
7. Encourage and support followers.
8. Invest in training and development.
9. Consolidate gains.
10. Create mechanisms of organizational governance.

The changing nature of today's work and workplace complicates the leadership and leadership training. The rate of change in types of work, organizational structures, globalization, and the way in which work is performed speaks to the need for higher quality and continuous leadership training (Amey, 2004; Barker, 2001; Parry, 1998).

Leadership Training Mechanisms

The value of experience in leadership training and development is best exemplified by the quote "I was made by my career" (Evans, 1992, p. 5). Although there is a growing recognition that leadership development is a key strategic initiative, leadership training often takes a back seat to the immediate challenges of the day. The fast-paced, competitive, and ambiguous business environment focused on short-term results is at odds with the cost and risks necessary to develop leaders (Evans; Ruvolo,

Peterson & Le Boeuf, 2004). Many organizations instead choose to recruit experienced leaders from outside as compared to developing a “strong bench” of internally developed leader candidates (Ruvolo et al., p. 14). Experience is the main and best teacher of leadership skills. Nevertheless, experiences must be wedded to a process that allows the leader the time to study, synthesize, and reflect (Eddy, 2005; McCall, 1998; Ruvolo et al., 2004).

Selection for Leader Development

To fill the leadership pipeline, corporate America conducts extensive leadership training. In 2001, the American Management Association (AMA) conducted a survey of its membership regarding training programs, program types, competencies, and outcomes. From an initial target of the AMA member and client base, 639 usable surveys were returned with a margin of error of plus or minus 4% (Delahoussye, 2001).

Less than 25% of the respondents mandated leader development training. Companies that mandated this training provided a combination of required and voluntary programs. Participants selected for training programs already possessed intermediate to high levels of experience. Over 43% of those selected for leadership development were between the ages of 40 to 59. The second largest group of participants was between the ages of 30 to 39, with 37% selected. Only 20% of employees selected for development programs were under the age of 30 (Delahoussye, 2001).

The most important selection criterion for selection to a leadership development program was prior work experience, as opposed to formal academic preparation. Less

than 10% of recent graduates were placed in a fast track leadership development program. Over 50% of companies rated current job experience as important in the selection of candidates for leadership development programs. Ironically, 50% of companies considered participation in a degree program as a part of their broader leadership development process (Delahoussye, 2001).

On average, only 35% of the companies reported female employees participating in leadership development programs. However, there was a wide range of responses based upon industry type. Industries such as agriculture, fishing, and forestry reported that 13% were female participants. On the other hand, education and health care reported participation rates as high as 60% for females. The racial makeup for leadership development programs selection was consistent with the 2000 census data with "23% of participants from non–European origins" (Delahoussye, 2001, p. 52).

Most of the training programs were ad-hoc or informal with less than 78% of respondent employees participating occasionally. This could be because companies see this sporadic level of participation as adequate or are not formally committed to the lifelong development needs for leader development and succession planning (Delahoussye, 2001; McCall, Morrison, & Lombardo, 1988).

Types of Leadership Development Programs

After completing leadership development training, leaders "should feel, think, and act differently and appropriately" (Tead, 1935, p. 297). Formal leadership development programs tend to follow one of three delivery modes: (a) classroom based which is most

common, (b) developmental which is more common and involves fostering mentoring and coaching relations, and (c) experiential ad-hoc which is least common (Hernez-Broome & Hughes, 2004; Pernic, 2001).

Delahoussye (2001) noted in his 2001 AMA survey that formal leadership training was dominated by classroom training with over 80% of programs relying upon lecture, video tapes, and meetings. The case study method utilized in business schools is not a staple of corporate leadership training, although companies regarded on-the job experiences as a form of case study learning (McCall, Lombardo, & Morrison, 1988; McCall, 1998). Companies that conducted training valued on-the-job activities, books, articles, and discussions of theory application over the case studies (Delahoussye, 2001; Hernez-Broome & Hughes, 2004).

Contemporary Leadership Skills

Although there are many leadership styles, behaviors, and approaches, current leadership training is focused upon strengthening relationship building, analytical, and communication skills (Delahoussye, 2001; Parry, 1998; Pernick, 2001). The leaders' relationship building skills are grouped around behaviors and activities leading to greater group cohesion and group socialization. The skills of working with teams, gaining trust, and relationship building are commonly occurring themes in leadership training programs (Delahoussye).

The following generic leadership training skill set and competencies are the focus of contemporary leadership development programs: (a) listening and talking skills, (b)

team building and support skills, (c) trust building skills, (d) people implementation skills, (e) agenda setting and implementation skills, (f) change management skills, and (g) self-efficacy or self-confidence (Delahoussye, 2001; McCall, 1998; Parry, 1998; Pernick, 2001). These skills are components of the themes of change and influence that have been discussed in leadership theories over the past 60 years. The ability of a leader to influence others to produce and manage change is the task most commonly associated with leadership (Hernez-Broome & Hughes, 2004; Uhl-Bien, 2003).

Influence is the leaders' ability to initiate or direct the change process. Influence can be directive or relationship based. Current literature and leadership theory suggests that a relationship orientated or transformational approach is an effective mechanism for initiating and managing change (Conger & Kanungo, 1998; House & Aditya, 1997; Keller 2006; Uhl-Bien, 2003). Uhl-Bien (2003) offers the following assumptions regarding leadership development:

1. Leadership occurs when individuals use influence to create change.
2. Leadership is a behavior, not a formal role (therefore, individuals not in formal roles are leaders when they use leadership behaviors).
3. Leadership influence to create change is enabled by effective relationships.
4. Leadership effectiveness is enhanced by the individual's ability to build effective work relationships with interdependent others.
5. More effective leaders are those who are able to build relationships with a wide range of others *rather than a select few* (Uhl-Bien, pp. 133-137).

There is however, still no defined and systematic way in which to train, develop, and assess the skills necessary to nurture work relationships in organizations. The development of social and group interaction skills remain difficult to reliably quantify (Amey, 2004; Uhl-Bien, 2003).

Emotional Intelligence

Wechsler (1958) defined intelligence as "the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment" (p. 7). Non-intellective abilities can be considered as falling under this definition, thus opening the concept for the inclusion of social intelligence described by Thorndyke (1937) and Gardner's concept of multiple intelligences that included "intrapersonal" and "interpersonal" intelligences (Gardner, 1983, p. 239).

One of the more promising contemporary theories related to the situational context of leadership and subsequently leadership development is the theory of emotional intelligence. The first use of this term was by Salovey and Mayer (in Goleman, 2001) as they attempted to describe an individual's ability to recognize and regulate emotions.. The theories built upon early theories of social intelligence and multiple intelligences (Keller, Humphrey, & Sleeth, 2006). Salovey and Mayer first defined emotional intelligence as "a form of intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and actions" (Salovey & Mayer, p. 189).

The most current accepted definition of emotional intelligence is “the ability to perceive emotion, integrate emotion to facilitate thought, understand emotions and regulate emotions and to promote personal growth” (Mayer & Salovey, 1997, p. 101). Emotional intelligence can also be described as being aware of or understanding the self and others in relating to people and adapting to varying daily situations (Bar-On, 1997).

Emotional Intelligence Models

Currently there are three separate but related models of emotional intelligence. These are (a) the ability model supported by Salovey and Mayer, (b) the ability and practice model focused upon co-dependent relationship supported by Ruven Bar-On, and (c) an applied personality and application model supported by Goleman (Stys & Brown, 2004).

Salovey and Mayer’s Ability Model of Emotional Intelligence

The premise of this model is that emotional intelligence is a new and unique intelligence that carries most if not all of the abstract reasoning components of current models of general intelligence. Solovey and Mayer theorize that emotions are indicators carrying information about relationships that are repeatable and interpretable, and persons demonstrating high levels of emotional intelligence have greater innate ability to recognize and regulate emotions (Mayer, Salovey & Caruso, 2002).

Individuals have varying abilities to recognize, process, and extrapolate emotional information, thus leading to variations in how different individuals react to the same type of emotional stimuli (Mayer, Salovey, & Caruso, 2002). Salovey and Mayer (1990)

describe their theory in the following four-branch model: (a) emotional perception; (b) emotional integration; (c) emotional understanding; and (d) emotional management.

The first branch, emotional perception, is a person's ability to be self aware of emotions and emotional needs and to express those emotions and needs to others. The second branch, emotional integration, is the individual's ability to differentiate between emotions and to identify the emotions influencing thoughts and subsequent actions. The third branch, emotional understanding, relates to a person's ability to recognize the transition from one emotion to the other. Finally, the fourth branch, emotional management, is the individual's ability to stay connected to an emotion depending upon how useful that emotion may be for a particular situation (Mayer & Salovey, 1990).

Tests of the Salovey and Mayer Model

Salovey and Mayer have developed two different tests of the Salovey and Mayer four-branch model. The first test, named the Multibranch Emotional Intelligence Scale (MEIS), indicated that emotional intelligence did not directly correspond to general intelligence or self-reported empathy. This test was not able to demonstrate the emotional integration component of the model. Due to the length of the test (402 items) and the inability to demonstrate evidence in support of the integration aspect of the model, Salovey and Mayer developed a new instrument.

This test instrument currently in use is the Mayer Salovey Caruso Emotional Intelligence Test (MSCEIT). This instrument, which was normed on a sample of 5,000 men and women, is designed for individuals over the age of 17. The test measures each of

the four branches of the model through 141 questions and generates six sub-scores for each of the four branches and a score for strategic and experiential emotional intelligence (Stys & Brown, 2004). The MSCEIT is used primarily to measure the ability of respondents to recognize emotions and adapt their or others' behavior to a situation. The MSCEIT does not measure workplace effectiveness or an individual's application or emotional intelligence skills.

The Ruven Bar-On Model (Bar-On) Model of Emotional Intelligence

The second model of Emotional Intelligence, the Bar-On model, examines individual's potential for performance and success but not actual performance or success. This model focuses upon the following emotional and social abilities:

1. The ability to be aware of, understand, and express oneself;
2. The ability to be aware of and understand others emotions;
3. The ability to deal with strong emotions; and
4. The ability to adapt to change and solve problems of a social or personal nature (Stys & Brown, 2004, p. 11).

The Bar-On model identifies five aspects of emotional intelligence: intrapersonal, interpersonal, adaptability, stress management, and general mood. This model uses a measure of emotional intelligence named the "Emotion Quotient" (EQ-i) and is administered as a self-report instrument. This instrument was normed on over 4,000 male and female respondents in the United States and Canada.

The EQ-i is used in business, research, and clinical settings and has the ability to discriminate between high and low perceived competences in all aspects of the five-phase

model. There are strong positive correlations between high performance on the EQ-i and career and academic success (Stys & Brown, 2004).

The Goleman Mixed Model of Emotional Intelligence

Goleman's model builds upon the work of Salovey and Mayer and that of Bar-On by adding a stronger connection to actual application of emotional intelligence skills. The four constructs of Goleman's model are self-awareness, self-management, social awareness, and relationship management. Self-Awareness is the ability to read and recognize ones emotions to guide decisions. Self-management is the ability to control ones emotions and impulses while adapting to changing circumstances. Social awareness is the ability to recognize, understand, and respond to others emotions in social or organizational settings. Relationship management is the ability to influence, inspire, and develop others and manage conflict (Goleman, 1995).

Each construct encompasses emotional intelligence competencies that Goleman believes to be learned capabilities (Stys & Brown, 2004). Goleman posits that emotional intelligence is an intrinsic skill or trait common to high performers and that the skills can be developed in individuals. He also draws upon the work of McClelland in attempting to show the connection between high levels of corporate performance and his four components of emotional intelligence.

Many measurement tools have been developed that are based upon Goleman's emotional intelligence model. His first instrument, the Emotional Competence Inventory (ECI), is a multi-rater instrument that measures behavioral aspects of emotional

intelligence. The ECI was normed on 6,000 respondents and has shown a positive correlation to the Meyers Brigs Type Indicator (MBTI) factors of sensing, intuiting, thinking, and feeling. In addition, the ECI has demonstrated a positive relationship with the extroversion, agreeableness, and conscientiousness factors of the Neuroticism (N), Extroversion (E), and Openness to Experience (O) identified in the NEO personality inventory questionnaire (Stys & Brown, 2004).

Another instrument, The Emotional Intelligence Appraisal (EIA) developed by Bradbury and Greaves, uses 28 items to measure the 4 components of Goleman's model of emotional intelligence (self-awareness, social awareness, self-management, and relationship management). This instrument has been normed on over 13,000 respondents worldwide and has demonstrated that it can be a predictor of job performance (Bradberry et al., 2003).

Leadership and Emotional Intelligence

Consideration as it relates to relationship development and the way in which leaders structure those formal and informal relationships received attention in the Ohio State University leadership studies of the 1950s. The specific behavioral indicators of the factors, labeled as consideration and initiating structure, isolated the leadership behaviors that were concentrated around structure and organization or consideration for employees' well being (Judge, Piccalo, & Ilies, 2004). Initiating structure can be defined as the extent to which leaders define their roles and follower roles in well-organized communication channels in pursuit of a goal. Leaders who are focused upon initiating structure may

exhibit and value task orientated behaviors. Conversely, consideration behaviors are defined by the degree to which a leader shows and expresses respect, concern, and consideration for followers by recognizing their interests and supporting their contributions (Judge, Piccalo, & Ilies).

The University of Michigan studies, while not cited as frequently as the Ohio State studies, also identified task (structure), relationship-oriented behavior, and participative leadership (consideration) as behavioral indicators of effective leaders (Katz & Kahn, 1952). The ability to establish mutual trust, consideration, and communication exhibiting warmth and rapport were also noted as characteristics of effective leaders. In this study, it was noted that effective leaders concentrated on both task and their relationships with subordinates in addition to utilizing a participative style to manage at both the group and individual level (Judge, Piccalo, & Ilies, 2004; Katz & Kahn). However, the focus on task or relationship behavior or some matrix relationship between the two did not completely explain performance differences between groups. The additional factor of leadership style was identified in the Michigan studies in the influence of leadership style on effective group performance.

Transformational leaders possess and practice consideration behavior consistent with the varying situational context of the organization. The ability to build collective confidence through the development of relationships with superiors and subordinates is a chief characteristic of transformational leaders. Leaders who practice relationship building ability by considering follower needs over their own, projecting this to other followers, providing inspiration in a context accepted by followers are seen as more

effective in the workplace. These transformational leaders must also provide intellectual stimulation of followers by not publicly ridiculing or criticizing an individual's work and recognizing and supporting the differences in each individual's need for achievement and growth (Bass et al., 2003; House & Aditya, 1997; Keller, 2006).

The leader behavior activities necessary to build and manage the complex social relationships to be successful are very similar to the relationship building and situational awareness components of emotional intelligence. Salovey and Mayer postulated emotional intelligence as an addition to conventional intelligence models as they attempted to describe an individual's ability to recognize and regulate emotions (Goleman, 2001). Emotional intelligence was first defined as "a form of intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and actions" (Salovey & Mayer, 1990, p. 189). The most current accepted definition of emotional intelligence is, "The ability to perceive emotion, integrate emotion to facilitate thought, understand emotions and regulate emotions and to promote personal growth" (Mayer & Salovey, 1997, p. 101). The awareness or understanding the self and others in relation to emotions and their effect on people in varying daily situations has a direct relationship to consideration behavior (Bar-On, 1997).

High levels of emotional intelligence have been positively correlated with good workplace performance in areas such as participative management, change management, putting people at ease, building and mending relationships, self awareness, straightforwardness, and composure (Ruderman, Hannum, & Steed, 2003; Schutte et al.,

2001). The combination of learned and innate behaviors and perceptions in relation to others in personal life and the workplace levels of emotional intelligence are instrumental in developing effective relationships.

Higher levels of emotional intelligence are indicators of an individual's ability to adapt to change and develop effective workplace relationships. Studies suggest that leaders who lack the ability to understand the emotional states of others or do not feel responsibility to others are likely to fail in the workplace. Feist and Barrons (1996) conducted a study of 80 PhDs who underwent a series of tests when they were graduate students in the 1950s; and later, their successes were tabulated via examination of resumes, evaluations and publications of those in their own field. They concluded that social and emotional abilities were four times more important than IQ when determining success and prestige (Feist & Barrons). A leader exhibiting lower levels of emotional intelligence may be identified by unawareness of their own emotions, unawareness of others emotions, inability to handle stress and angering easily which could lead to poor workplace performance (Ruderman, Hannum, & Steed, 2003: Schutte et al., 2003).

The consideration behaviors associated with effective leaders are also related to emotional intelligence. In studies focused on the relationship between transformational leadership, leader emergence, and emotional intelligence, it was found that the higher levels of emotional intelligence predicted leader emergence and were related to transformational leadership (Daus & Ashkanasy, 2005). Emotional intelligence has been linked with increased employee job satisfaction and leadership emergence (Ashkanasy & Dasborough, 2003). Positive correlations between high levels of the understanding

emotions factor of emotional intelligence and transformational leadership have been identified through research (Ashkanasy, 2004; Ashkanasy & Dasborough; Daus & Ashkanasy). These studies also indicated that group performance would increase when the leader exhibits high levels of emotional intelligence (Ashkanasy, 2005). This management of the complex social and personal dynamics of organizational change in the political arena has also been studied. A 2005 study on the relationship between emotional intelligence and transformational leadership of a group of elected officials showed positive relationships between emotional intelligence factors and transformational leadership factors (Barbuto & Burbach, 2006). Also, Yoder (2005) found, in her study of 100 leaders of a large urban community college, positive correlations between the emotional intelligence competencies of (a) developing others, (b) empathy, (c) respect, (d) organizational awareness, and (f) transformational leadership qualities of teamwork and collaboration, organizational climate, building bonds, visionary leadership, and open communication (Yoder, 2005).

Simulations

The ability to create a context for organizational change and improvement is the challenge leaders face (Hill, 2004). Experience is one of the most important activities in developing well rounded leaders who have a full range of leadership skills. Moreover, leadership researchers and theorists speak to the necessity of experience in creating well-trained leaders. In the business world, taking a chance that a new leader will make a serious or critical mistake is an option few businesses can afford to make (McCall, 1998).

Organizations concerned with the development of leadership skills must make a decision as to how much risk they are willing to take in the on-the-job training of new leaders (McCall, 1994; 1998).

Classroom instruction is the most commonly used form of leadership training and provides a repeatable process to introduce and describe competencies in addition to creating a common evaluation base. However, this form of leadership training very rarely makes a manager competent, and it is only through the combination and practice of learned skills and observed behavior that a leader begins to emerge (Hill, 2004; McCall, 1998). New managers in leadership roles learn how to manage and lead by wrestling with opportunities and consequences, many of which may not have been presented or contextually described in formal training (Hill, 2004; McCall, 1998; Mintzberg, 2004).

The myriad forms of organizational retribution and punishment that a new leader experiences can be daunting and can make some new leaders reluctant to make the quick decisions necessary in today's business environment (Faria, 1998; Keys, Fulmer, & Stumpf, 1996; McCall, 1998). Designing a leadership training and development process that provides for the ability to make mistakes without fear of retribution and receive support and assistance are important elements for learning. One promising approach in the development of leadership skills is the use of simulations and games.

The simulation war games of Wei-Hai were one of the first noted uses of games for education and development and were developed in China in about 3000 BC (Keys & Wolfe, 1990). Militaries throughout history continued to use war games and simulations for training applications. For example, Sparta's war games used by the Prussian military

allowed participants to practice combat skills and to see how individuals would function when placed in invented situations or scenarios (Bozeman & Wright, 1994). Simulations also have continued to be used in a wide variety of industries as a way to allow individuals to assume roles, practice competencies, and test alternative strategies of decision making and leadership in a risk free setting (Bozeman & Wright; Picket, 1992; Wright, 1993).

The transition from military to commercial application began in the 1950s with Rand Corporation's simulation Monopologs. Monopologs was used to simulate the U.S. Air Force industries management supply system to train new managers in logistics and decision-making. This pencil and paper simulation was most commonly employed for training employees at individual companies. Although effective, this type of training hinders practice with radically alternative strategies due to the visibility of participants' inputs and fear of subsequent repercussions (Faria, 1984; Keys & Wolfe, 1990).

This ability that business games and simulation offer for testing and rehearsal of strategies is also a predictor of future leader success (Wright, 1993). A five-year longitudinal study of a group of graduating seniors from a Southwestern university demonstrated that certain behavioral aspects of the players translated into later personal success (Wolfe & Roberts, 1993). Individual game players were ranked by peers in the categories of: (a) contribution to the teams' economic need, (b) contribution to the team's social needs, (c) influence on the team's ultimate decision, (d) leadership abilities, (e) admiration and esteem, (f) desire for continued association, and (g) estimated ultimate

career success. Those players ranked higher in these categories by peers demonstrated higher levels of success than did lower ranked participants (Wolfe & Roberts, 1993).

Although games may not be a realistic representation of the real world, they do provide the opportunity to explore options in a risk free setting (Degnan, 2000; Bass, 1964: Keys & Wolfe, 1990; Scherpereel, 2005). This use was a logical extension of early operations research programs that rose to prominence during the early 1950s. By the late 1950s, the development of group change and learning theories gave added impetus to the creation and use of simulations and business games (Keys & Wolfe). Growing understanding of group change theories and the development of a theory of experience-based learning as a component of behavioral change also contributed to the rise in business games and simulations (Kayes, Kayes, & Kolb, 2005; Lewin, 1951; Schein & Bennis, 1965).

Simulation can be classified as two different types. The first type is the functional business game and is focused on subunit or specific competency areas of an organization such as accounting or purchasing (Keys & Wolfe, 1990). The second type of game or simulation is the enterprise level game that attempts to simulate wide and complex groups of industries and skills such as leadership and corporate management (Faria, 1984; Hayes & Wolfe, 1990). Many early simulations, taking place during the 1950s through 1970, also focused upon functional skill development for fairly well defined business situations and skill sets. This was due to the focus on hierarchical business models and roles espoused by learning management and leadership theories at this time (Burke & Day, 1986; Kayes, Kayes and Kolb, 2005).

Business simulations quickly expanded to include enterprise wide games and simulations applications focused on skill transfer and behavioral change (Faria, 1998; Wolfe & Keyes, 2001). The need for safe practice fields, for managers to have an opportunity to learn from past failures and for students to experience some of the challenges of corporate life, has spurred the development of business games and simulations since the 1960s (Keys, Fulmer, & Stumpf, 1996). In addition, the educational use of simulations has grown dramatically. The first known use of business simulations in a university setting was more than 45 years ago at the University of Washington in 1957. At the time of the present study, more than 97.5% of the Association to Advance Collegiate Schools of Business (AACSB) schools reported using classroom simulations (Faria).

There is a growing recognition that public and private businesses are learning organizations requiring the acquisition, assimilation, and integration of new competencies. The development of these new competencies can be accelerated without disrupting the organization using simulations and simulation based training (Degnan, 2000; Faria, 1998; Fulmer & Keys, 1998; Keys, Fulmer, & Stumpf, 1996).

Experiential Learning

The business gaming and simulation movement benefited from the rise in theory development related to experience-based learning and behavioral change. Experiential learning requires that a participant be personally engaged in some type of meaningful activity during training (Faria, 2001; Kayes, Fulmer & Stumpf, 1996; Kayes, Kayes &

Kolb, 2005; Keys & Wolfe, 1990). Participants who are engaged in an experiential learning activity draw upon their prior learning and experience in combination with the new skills learned as part of the experience. This provides a deeper and more comprehensive learning experience (Kayes, Fulmer & Stumpf; Keys & Wolfe). Experiential learning theory suggests that in order for this type of learning to be successful, it: (a) is accompanied by an optimal amount of emotional arousal, (b) takes place within an environment of safety, and (c) is accompanied by adequate processing time and a clear summary to provide a cogitative map for understanding the experience (Bowen, 1987).

Some theorists use a four-phase model that addresses the behavioral, attitudinal, and knowledge changes that occur during experimental learning. This model begins with the participants prior to concrete experience and new experiences. The second phase of the model provides the opportunity for observation and reflection of past and new learning experiences where the learner derives abstract concepts and generalizations. These concepts and generalizations lead to a third stage of new hypotheses and actions which the learner will test with new experiences in the fourth stage (Brenenstuhl & Catalanello, 1977; Wolfe & Keyes, 1996).

There are, however, some criticisms of business games and simulations. First, the tendency to create games for specific industries may not provide a broad enough skills base to generalize learning. Second is the difficulty incurred in evaluating an individual student's efforts if the student participated as a member of a team since performance by a team may mask an individuals' performance. Third, if a game is not challenging enough

or is too challenging, managers may refuse to play because of the fear that they may lose stature if they perform poorly. Finally, it is difficult to emulate the complex social environment and context of the real world (Brenenstuhl & Catalanello, 1977; Burke & Day, 1986; Faria, 1984; Wolfe & Keyes, 1990).

The mounting complexity of today's workplace is placing greater pressure on individuals and organizations to learn and grow as social systems (Kritz, 2003, Ng and Ng, 2004). Although there are recognized weaknesses and concerns with business games and simulations, they have been widely accepted by universities and businesses (Brenenstuhl & Catalanello, 1997; Faria, 1998). One reason for this broad acceptance is that they allow behavior to be studied as it occurs in a dynamic system such as management or leadership. This allows both the trainer and trainee to evaluate and modify complex behaviors leading to performance (Brenestuhl, Catalanello, Faria, 2001). Business games and simulations provide immediate feedback on continuous or intermittent schedules depending upon the game design. This reinforcement leads to behavorial changes supported by the concept of Skinnerian reinforcement schedules (Brenenstuhl & Catalanello; Latham & Saari, 1979; Scherpereel, 2005). Engaging learners as they use the multitude of inputs available in business simulations creates a more effective learning environment (Faria, 1998).

Computer based Simulations and Games

The introduction of computers to the business arena in the early 1960s accelerated the implementation of business related simulations for modeling and training purposes.

Many pencil and paper based simulation games were adapted to mainframe and PC based computer systems (Keys & Wolfe, 1990; Ng & Ng, 2004). While this adoption provided early users opportunities to save results and remotely participate, many of the pencil and paper based simulations and games had to be redesigned. The Internet and World Wide Web, in addition to newer technologies that allow distributed team participation, is further increasing participation and use of these training environments (Asakawa & Gilbert, 2003). This trend is continuing with the application of business games to PC and Wed-based systems. The Horizon Report of 2006 identifies educational gaming and simulation as an emerging technology likely to have a large impact on education over the next two to five years (New Media Consortium, 2006).

A computer based simulation can allow a user to participate in immersive experiences in smaller blocks of time, providing immediate return to the simulation if it was not concluded (Foreman, 2004; Kritz, 2003). Simulations allow users to test multiple contents in different contexts, and rehearse strategies that allow them the freedom to respond in ways not acceptable in the workplace. This ability adjusts the reality of a simulation to improve outcomes and gives the participant the ability to rapidly practice and reinforce successful strategies (Boser, 2002; Foreman). Computer based simulation allows for multiple iterations and permutations of a training exercise and the acceleration of results providing instant feedback on a particular strategies success or failure (Aldrich, 2002).

The wide reach of computers and non-educational computer games in society at the time of this study had established a familiarity with the basic technology of these

systems and an expectation of students that education and training could be delivered through this venue (Aldrich, 2002; Boser, 2002; Foreman, 2004). Rapid access to academic and other information through the Internet allows students to tailor unique educational experiences (Aldrich, 2002; Delahoussye, Zemke, & Miller, 2001; Foreman, 2004). These students also demonstrate improved learning persistence through participation in computer based simulations. Students participating in a Navy technical training program demonstrated higher levels of chosen difficulty level and longer time on task when participating in a computer based simulation. Higher levels of difficulty were a motivating factor in this computer-based simulation with most students preferring difficult variable outcome problems (Whitehill & McDonald, 1993). The use of computer based simulations may also affect behavior and beliefs or, in other words, influence the affective domain skills identified in Bloom's Taxonomy (Adkins, 2004; Delahoussye, Zemke, & Miller; Foreman). The term, affective domain, comes from Bloom's taxonomy that defines three overlapping learning domains: cognitive skills, psychomotor skills, and attitudinal (affective) skills (Adkins; Krathwohl, 2002). The revision of the taxonomy in 2000 provided a clear description of the affective domain through metacognitive knowledge (Krathwohl; Pintrich, 2002).

Metacognitive knowledge has been simply defined as thinking about thinking. The ability of an individual to understand which strategies to use, and how to regulate them while learning, is critical for successful learning (Pintrich, 2002). According to Pintrich (2001), "Metacognitive knowledge includes knowledge of general strategies that might be used for different tasks, knowledge of the conditions under which these

strategies might be used, knowledge of the extent to which these strategies are effective, and knowledge of self" (p. 220).

This same group of skills and abilities are embedded in computerized educational simulations. The ability to recreate an experience or try something and not succeed, coupled with a safe environment that allows time to determine what happened, is the most attractive feature of simulations (Davies, 2003). The experiment of a context-rich learning simulation is very much like the age-old experience of a master artisan training an apprentice (Davies).

Companies such as SimuLearn, WILL Interactive, Cisco, Kaplan, and Insight Experience currently have simulations on the market allowing students to practice their affective domain metacognitive skills (Adkins, 2004; Davies, 2003; Vallego, 2006). These intelligent or "open" simulations present the user with a complex and dynamic business problem that a user cannot master simply by trial and error (Foreman, 2004; Vallego). These products deal with subjects such as ethics, teamwork, innovation, leadership, motivation, and conflict management (Adkins; Foreman, 2004). When applied to the social systems of current organizations, simulations assist participants in developing a greater intuitive understanding of how different factors interact (Adkins; Foreman; Powell, 2001).

In computer-based simulations, participants interact through the screen and keyboard, with the screen becoming the window to the simulated world (Coleman & Crookall, 1992). Successful simulations share similar design elements: authenticity, relevance, multiple options, engagement, and replayability (Powell, 2001). The addition

of Web based components and interaction to simulations add additional options to designers to create these engaging virtual environments (Powell).

Virtual Leader

A web-based simulation that incorporates the design elements of a successful game is Virtual Leader developed by Simulearn, Inc. Virtual Leader is a computer based leadership simulation game designed to allow participants to practice their relationship building and influence skills in a lifelike game environment. This program communicates to students the importance of emotions and influence as they try to move ideas through the organization to completion. Students, given the opportunity to practice different leadership styles in a safe environment, can practice strategies and tactics in the appropriate exercise of power and influence as they maneuver an idea to completion in this virtual world.

Using the game and the embedded evaluation tools, students also receive feedback and suggestions on individual skills that may need development and advice on how the skills could be developed through leadership style evaluations (see Figure 1).

Simulearn describes this simulation as “practiceware for people skills” and claims users will make significant improvements in their influence and relationship building skills as the result of participating in the simulation and practicing their new skills (C. Aldrich, personal communication, March 20, 2006; Aldrich, 2004). Users of this simulation, such as Muller at Yale School of Management also described the learning gains students made in their understanding of the complexities of decision-making and

influence in organizations (SimuLearn Testimonial Letter, July 18, 2006).

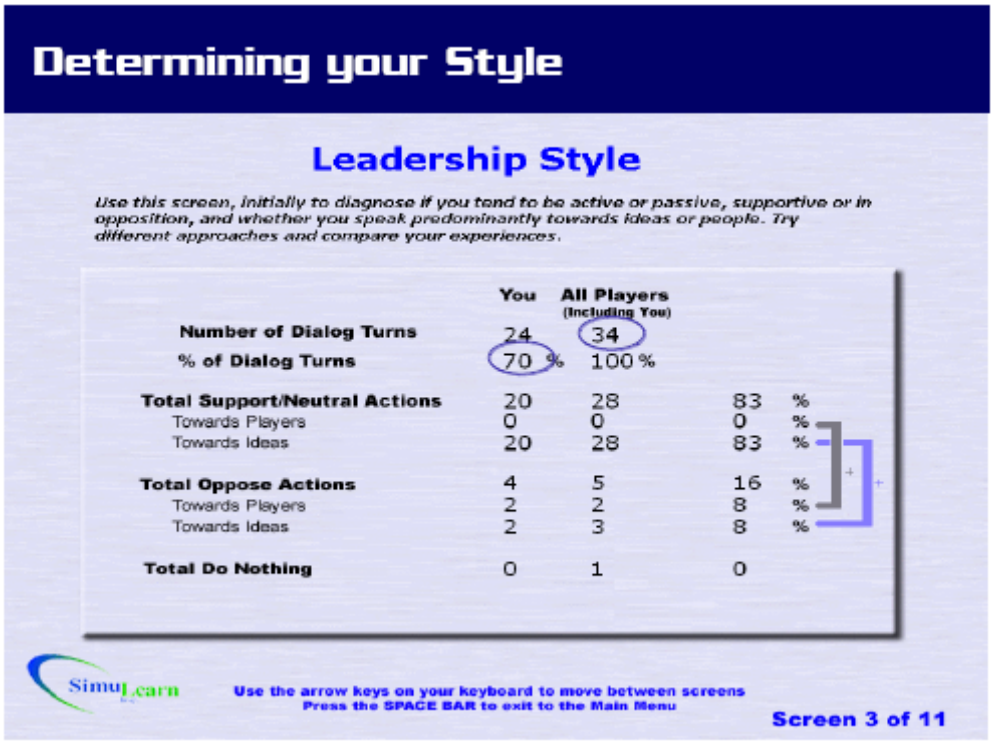

Figure 1: Leadership style scorecard

These people skills also are described as components of emotional intelligence and transformational leadership. Emotional intelligence skills, such as being aware of or understanding the self and others in relating to people and adapting to varying daily situations, are also contained within the descriptions of emotional intelligence and transformational leadership (Bar-On, 1997; Daus & Ashkanasy, 2005).

The dynamic systems skills of situational awareness, active listening, verbal and nonverbal communication, gaining and using influence, team building and collaboration, motivation and persuasion, influencing group dynamics, empowerment and motivation of others, effective communication, and decision making aligned with strategic business

goals are taught through this simulation (Aldrich, 2003; L'Allier, 2003; SimuLearn, 2006). Through the use of visual cues provided by the simulation participants can practice various styles to manage or change the simulated situation (see Figure 2). Participants can practice these skills by using directive, participative, or delegative decision-making, receiving feedback and assessment of their individual performance (Chemers, 1997; Dowd, 1975; SimuLearn). Through repeated reinforcement, students who have participated in this simulation increase the incidence of the following positive behaviors: (a) treating others as equals, (b) leading others with personal influence, (c) helping others to do better, (d) persuading others towards cooperative efforts, (e) creating achievements, (f) assertively and openly expressing ideas, and (g) expressing positive energy towards results (Borzo, 2004; SimuLearn).

Figure 2: Body language and active listening

Successful players and leaders must be able to read, correctly interpret, and manage the verbal and non-verbal cues expressed by other participants in the simulation and in real life and be aware of or understand their self and others when relating to people and adapting to various situations (Aldrich, 2003; Bar-On, 1997; Mayer & Solovey, 1990). These cues are influenced by emotion or tension and participants practice strategies to manage tensions or emotions as they chart a path towards completion of the correct work or furthering organizational change (C. Aldrich, personal communication, March 20, 2006; K. Kupersmith, personal communication, January 26, 2006; SimuLearn, 2006; Uhl-Bien, 2003). The recognition of verbal and non-verbal communication cues

and their effective use to pursue an agenda can be practiced in the simulation (see Figure 3).

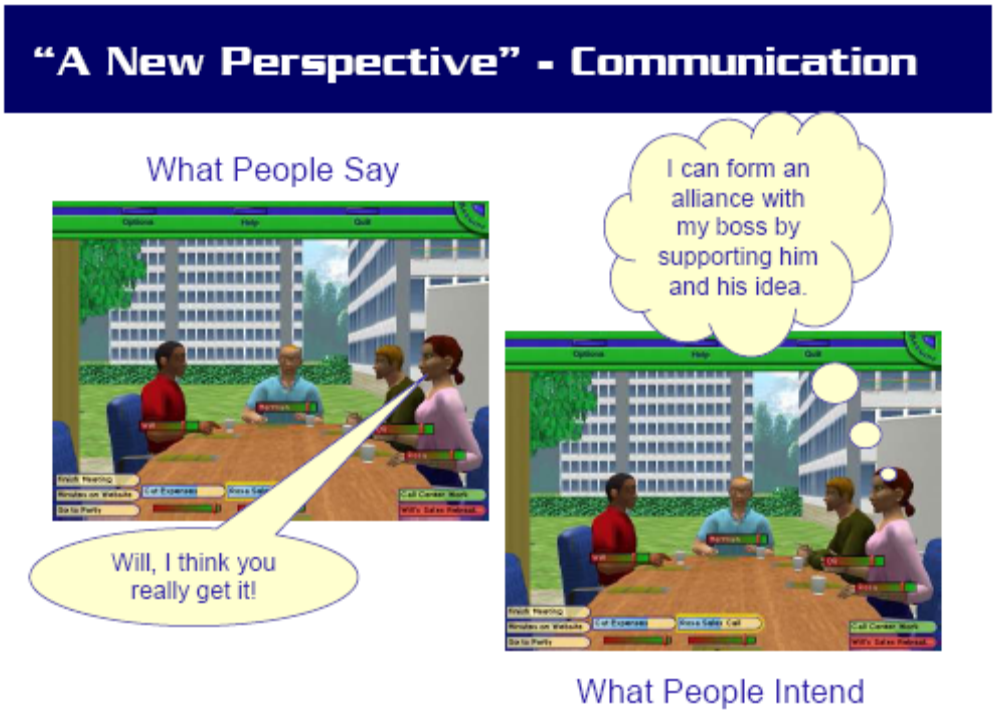

Figure 3: Verbal and non-verbal Communication

In Virtual Leader, participants interact with the simulation through a series of increasingly more complex meetings with many revealed and hidden agendas (see Figure 4). Through these meetings, leaders practice the art of leadership as they attempt to influence characters to produce the right work to further the goals of the organization (Lowell, 2003). The development and use of interpersonal and relationship building skills is evident as the agenda changes due to the influence of other characters' leadership skills.

Figure 4: Complex meetings

The ability to build and support positive relationships and project influence is also regarded as a characteristic of effective leaders (Uhl-Bien, 2003).The simulation focuses on how interpersonal skills influence leadership effectiveness as a “metaphor for all leadership skills” (C. Aldrich, personal communication, March 20, 2006). Simulation participants can practice situational awareness, interpersonal, and relationship building skills in a safe and virtual setting. The simulation allows leaders to practice skills and approaches multiple times in short order, thus allowing experimentation opportunities not available in real life. Leaders in real life acquire these types of skills over years of experience and training, primarily in situations where there is little chance to redo the experience or the outcome (McCall, 1998; Pernick, 2001). Participants practice their

situational awareness and begin to learn how to think strategically about how and when to push through ideas, provide information, and promote suggestions. Within the simulation, as in real life, your situational awareness helps you anticipate which communication skills to utilize (Aldrich, 2002; McCall; Mayer and Salovey, 1990).

The verbal and non-verbal expressions of interest and support or non-support by people in real life are also mimicked in the simulation by the simulation characters. These characters are able to demonstrate up to 200 body gestures at contextually appropriate or inappropriate times during the simulation. For example, the verbal and non-verbal expressions of the game characters can be customized to show high or low respect for authority or high or low tolerance for information. They can indicate approval or disapproval of an idea nonverbally (smiling, frowning, eyes widening, or pushing back from the table after a comment) or verbally as they try to press their agenda (Aldrich, 2004; Becker, 2004; Hoover, 2005).

This simulated setting focuses upon development and practice of effective people or relationship building skills that are components of emotional intelligence. The same skills of situational awareness, building and mending relationships, self-awareness, and straightforwardness and composure are regarded as indicators of high levels of emotional intelligence and demonstrated by effective leaders must be demonstrated in order to be successful in the Virtual Leader simulation game (Aldrich, 2004; Becker, 2004; Lowell, 2003; McCall, 1998).

Summary

The characteristics effective leaders display and how they learn those skills is a well-researched area in contemporary business and organizational studies. Effective leadership is generally described through the description of the interpersonal skills leaders exhibit as they interact with others. The theory of emotional intelligence supports the situational awareness, emotional regulation, and relationship development and management skills that effective leaders exhibit. The literature studied shows a direct relationship between these skills and what is currently regarded as effective leadership. Although there are many leadership training programs, real-life experience is still considered the best way to develop a leader.

Recent development of computer simulations is providing an alternative to real-life leadership training. The power and sophistication of these simulations allows leaders to practice the interpersonal and affective domain skills acquired through years of real-life successes and mistakes. The findings of this study have advanced the body of knowledge by testing the application of simulation based leadership training with student groups at a community college as it applies to emotional intelligence. Chapter 3 describes the instrumentation, methodology, the population, data collection, statistical analysis, and the reporting process.

CHAPTER 3
DESIGN OF THE STUDY

Introduction

The purpose of this study was to examine the relationship between participation in the virtual leader computer-based leadership simulation-training program and the participants' self-perceived changes in emotional intelligence behaviors. This research measured for significant differences in the means of measured variables of current leadership position, length of time employed, age and ethnicity of the respondent, gender, and amount of time participating in the institution's leadership development program. The researcher sought and received approval of the University of Central Florida's Institutional Review Board (Appendix E).

Research Questions

Following are the research questions which guided this study:

1. How do members of a leadership training or student cohort rate their emotional intelligence skills prior to participation in simulation-based leadership training?
2. How do members of a leadership training or student cohort rate their emotional intelligence skills after participating in simulation-based leadership training?

3. Is there a statistically significant difference in participants' ratings of their emotional intelligence skills after participating in simulation-based leadership training?
4. Is there a statistically significant difference in participants' ratings of their emotional intelligence skills by race, age, number of years employed, gender, or position type.

Instrumentation

In order to investigate the research questions which guided this study, the researcher requested and received permission to use the Wong and Law Emotional Intelligence Scale (WLEIS) developed by Chi-Sum Wong and Kenneth Law of the Chinese University of Hong Kong. This instrument was developed to establish a psychometrically sound and short measure for use in leadership and management studies. The instrument demonstrated Cronbach alphas ranging from .83 to .90 for the four subscales of self emotion appraisal (SEA), other emotion appraisal (OEA), use of emotions (UOE) and regulation of emotions (ROE) (Wong & Law, 2002). A study by Hartsfield (2003), using the WLEIS to investigate emotional intelligence and transformational leadership, found a Cronbach alpha of .88 and extracted the same four factors as Wong and Law. Confirmatory factor analysis showed .81 (SEA), .81 (OEA), .73 (UOE), and .86 (ROE) (as cited in Parolini, 2005). The questionnaire(s) used prior to and after the simulation are presented in Appendixes B and C.

This questionnaire asked the respondents to indicate their perceived level of emotional intelligence in the areas of: (a) self-emotion (b) other-emotion, (c) use of emotion and (d) regulation of emotion..Respondents used a seven-point Likert scale that ranges from *Strongly Disagree* to *Strongly Agree*.

Procedure for Data Collection

Introductory management classes in the Bachelors of Applied Science program, introductory business principles classes in the Business program, and the leadership development cohort at Daytona Beach Community College were invited to participate. The students in the BAS and BUS classes were asked to participate by the researcher at the beginning of the fall 2006 and spring 2007 semesters in the first class session of the semester. A total of 300 questionnaires (Appendixes B and C) were distributed to the students in the Bachelor of Applied Science (BAS) and Business and Hospitality (BUS) programs in course sections identified by the respective deans and faculty of these programs.

A total of 201 questionnaires representing 103 individuals were returned, garnering a 67% return rate. The questionnaires were presented to the students by the researcher and the faculty of the BAS and BUS programs. The students were verbally invited to participate and were presented with the informed consent document (Appendix B). Participant rights, voluntary consent, and the right to withdraw consent were presented to participants prior to distributing the questionnaire. Students electing to

participate completed the first questionnaire in class and either returned the instrument in class or via a self-addressed postage paid return envelope.

After return of the completed questionnaire, participants were given or mailed the software disk for the Virtual Leader software. Upon receipt of the software, participants were assisted in installing the software to classroom computers and were provided with installation instructions for their home computers. Installation and simulation technical assistance was provided by the researcher via both telephone and e-mail. Participants were instructed to complete each of the first four levels of the Virtual Leader simulation one time and to complete each of the next five levels three times each. Participants were provided e-mailed reminders by the researcher and an e-mailed acknowledgement of their progress by the researcher. Upon completion of the simulation, participants completed a second administration of the questionnaire and returned it to the researcher through collection by the classroom instructor or via a self-addressed postage paid return envelope. Results of the survey were provided to any participant who requested the information.

Those surveys returned with missing responses were not included in the statistical analysis. Out of the 201 questionnaires returned, 182 representing 91 individuals were recorded as complete in all respondent items and completion of all levels of the simulation. The researcher was able to monitor simulation participation via administrator level access to the software program. The questionnaires of participants not completing all levels as instructed were not included in the statistical analysis. The maximum sample size from the population was limited to the 150 licenses of the virtual leader software.

Data Collection and Analysis

The research study utilized both qualitative and quantitative data. Over 300 students of Daytona Beach Community college were asked to complete the WLEIS questionnaire. The quantitative data in the form of emotional intelligence pre-test and post-test scores were gathered from the answers to the questionnaire. The questions related to the four constructs of emotional intelligence were distributed throughout the questionnaire and are displayed in Appendix D. Qualitative data in the form of respondent position type, age, ethnicity of the respondent, and gender were gathered from the questionnaire. All data were analyzed using the Statistical Program for Social Sciences (SPSS) software program.

The survey data were analyzed using frequency tables and comparisons, repeated measured t-tests, and a one-way repeated measures analysis of variance (ANOVA). All survey questions and those related to each of the key elements were reviewed in the areas of self-emotion, other emotion, use of emotion and regulation of emotion, Individual respondent score data were correlated with the following data: respondent position type, length of time employed at the college, ethnicity of the respondent, and gender. Significance at the $p>.05$ level was the basis for statistical comparisons.

Procedures for Data Analysis

Research Question 1

Research question 1 was focused on an examination of participants' self-perception of emotional intelligence before participation in the virtual leader simulation.

Frequency tables were developed for each of the 16 emotional intelligence questions presented in the survey instrument (Appendix C). These questions were correlated to the Likert-type scale responses and are reported in Chapter 4. In addition, a total response percentage frequency table and comparison was developed for this question.

Research Question 2

Research question 2 permitted an examination of participants' self-perception of emotional intelligence after participation in the virtual leader simulation. Frequency tables were developed for each of the 16 emotional intelligence questions presented in the second administration of the survey instrument (Appendix C). These questions were correlated to the Likert-type scale responses and reported in Chapter 4. In addition, a total response percentage frequency table and comparison was developed for this question.

Research Question 3

Research question 3 was investigated using a paired-samples or repeated-measures t-test. This test is most frequently used when data are collected for the same group on two different occasions such as before and after some type of experimental intervention (Coladarci, Cobb, Minium, & Clarke, 2004). This procedure was used in comparing the paired samples from research questions 1 and 2. The Likert scores from the pre test and posttest administration of the questionnaire were used to develop quantitative data for analysis.

Research Question 4

In order to examine research question 4, a one-way repeated measures ANOVA was employed. The one-way repeated measures ANOVA is used to determine if an observed difference in the means between the groups is due to random variability or sampling error when two or more groups or trials are present for each independent variable and there is one continuous dependent variable. The one-way repeated measures ANOVA allowed this researcher to compare the variability between the two groups with the variability (potentially due to chance) within each of the groups (Pallant, 2006). The F ratio is calculated as the variance between the groups divided by the variance within groups. A large or significant F test indicates that the population means are not equal (Pallant). Significance levels at the $p>.05$ were the basis for statistical comparisons. The pre and posttest emotional intelligence scores for the subgroups of SEA, ROE, UOE, and OEA were compared to race, age, gender, position type, and years employed. Significance levels at the $p>.05$ were the basis for statistical comparisons.

Summary

Leadership can be examined through a number of differing perspectives. One common thread is the perspective that effective leaders are in some way able to build effective workplace relationships that support both the needs of the organization and individuals working within the organization. The skills necessary to develop effective workplace relationships are also components of the theory of emotional intelligence. These skills have been traditionally developed through a combination of on-the-job

experiences and formal training. Recent improvements in computer-based simulations allow the development of these skills in an environment removed from real life, allowing participants to independently experiment with numerous approaches to build effective relationships.

The purpose of this study was to investigate the relationship between participation in a computer based leadership simulation and emotional intelligence skills. This research study tested the theories and constructs of emotional intelligence as developed through a computer-based simulation. Results of this study are presented in Chapter 4.

CHAPTER 4
ANALYSIS OF THE DATA

Introduction

The purpose of this study was to examine the relationship between participants' perceptions of emotional intelligence behaviors prior to and after participating in a computer based leadership simulation-training program. Analyzed for statistically significant differences were the overall means of self-perceived emotional intelligence and the means compared by race, age, number of years employed, gender, and position type .

The research addressed the following questions:

1. How do members of a leadership training or student cohort rate their emotional intelligence skills prior to participation in simulation based leadership training?
2. How do members of a leadership training or student cohort rate their emotional intelligence skills after participating in simulation based leadership training?
3. Is there a statistically significant difference in participants' ratings of their emotional intelligence skills after participating in simulation based leadership training program?
4. Is there a statistically significant difference in participants' ratings of their emotional intelligence skills by race, age, number of years employed, gender, or position type?

Data Collection and Response Rate

Potential student participants were verbally invited to participate in the study and were presented with the informed consent document (Appendix B). Participant rights, voluntary consent, and the right to withdraw consent were presented to participants prior to distributing the Wong and Law Emotional Intelligence Survey (WLEIS). The survey instrument (Appendix C) was presented to the students by the researcher and the faculty of the BAS and BUS programs. Students electing to participate completed the first survey instrument in class and either returned the instrument in class or via a self-addressed postage paid return envelope.

After return of the completed survey, participants were given or mailed the software disk for the Virtual Leader software. Upon receipt of the software, participants were assisted in installing the software to classroom computers and were provided with installation instructions for their home computers. Installation and simulation technical assistance was provided by the researcher via telephone and e-mail. Participants were instructed to complete each of the first four levels of the Virtual Leader simulation one time and to complete each of the next five levels three times each. Participants were provided e-mailed reminders by the researcher and an e-mailed acknowledgement of their progress by the researcher.

Upon completion of the simulation, participants completed a second administration of the WLEIS (Appendix C) and returned it to the researcher through collection by the classroom instructor or via a self-addressed postage paid return

envelope. Results of the survey were provided to any participant who requested the information.

A total of 300 survey instruments were distributed to the students in the Bachelor of Applied Science (BAS) and Business and Hospitality (BUS) programs in course sections identified by the respective deans and faculty of these programs. A total of 201 questionnaires representing 103 individuals were returned, garnering a 67% return rate. Those surveys returned with missing responses were not included in the statistical analysis. Of the 201 survey instruments returned, 182 representing 91 individuals were recorded as complete in all respondent items and simulation levels as instructed, yielding a final useable return rate of 60.7%.

Demographic Data

A summary of the responses to the demographic section of the questionnaire is presented in Table 1. A total of 91 individuals responded to all demographic questions regarding their gender, age, years employed, race and position type in addition to completing all simulation levels as instructed. A majority of the participants (63, 69.2%) were women, and 28 (30.8%) were men. In reference to the age of the respondents, the 91 individuals completing this survey question were between the ages of 27 and 65. A total of 27 (29.7%) were between 18 and 33 years of age. A majority of respondents (43, 47.3%) were between 34 and 47. The remaining 21 (23.1%) comprised the oldest group whose ages were between 48 and 65.

Table 1
Descriptive Data for Virtual Leader Participants (N = 91)

Variable	n	%
Gender		
Male	28	30.8
Female	63	69.2
Age		
18 – 33	27	29.7
34 – 47	43	47.3
48 – 65	21	23.1
Years employed		
1 – 10	46	50.5
11 – 20	28	30.8
21 – 27	17	18.7
Race		
African American	14	15.4
Hispanic	4	4.4
Asian or Pacific Islander	1	1.1
Alaskan or other native American	2	2.2
White/Caucasian	70	76.9
Position		
Administrative, profession, career	47	51.6
Faculty	15	16.5
Service and self employed	29	31.9

The 91 participants who completed this survey question reported the number of years they were employed as follows: A total of 46 (50.5%) were employed from 1-10 years; 28 (30.8% were employed 11-20 years; and 17 (18.7%) had been employed between 21-27 years. The ethnic groups self identified by the 91 respondents were as follows: White/Caucasian, 70 (76.9%); African American, 14 (15.4%); Hispanic, 4 (4.4%); Alaskan/Native American, 2 (2.2%); and Asian/Pacific Islander, 1 (1.1%).

Of the 91 individuals who responded as to their position type, a majority of those responding, 47 (51.6%), were self classified as administrative, professional, or career employees. Service and self employed respondents numbered 29 (31.9%) with 15 (16.5%) classifying themselves as faculty.

Research Question 1

The first research question inquired as to respondents' perceptions of their feelings prior to participating in a leadership simulation. For this study, the perception of feelings was identified as a component of emotional intelligence and referred to respondents' ability to appraise their own emotions, appraise others' emotions, make use of emotions directed toward the individual, and regulate their own emotions.

The instrument used in this study to measure emotional intelligence was developed and validated by Wong and Law (2002) and utilized 16 items comprising 4 subscales. The participants were asked to rate a total of 16 items from which four subscale appraisals and an overall emotional intelligence appraisal could be derived. A Likert-type scale ranging between 1 and 7 was used where 1 = strongly disagree, 2 = disagree, 3 = moderately disagree, 4 = neither agree or disagree, 5 = moderately agree, 6 = agree; and 7 = strongly agree.

The first subscale, self-emotion appraisal (SEA), refers to the ability of individuals to understand their deep emotions and to be able to express these emotions naturally. The questions addressing the subscale of self- emotion appraisal were 1, 5, 9, and 13. The second subscale, others-emotion appraisal (OEA), is the ability of

individuals to perceive and understand the emotions of those people around them. The questions addressing the subscale of others-emotion appraisal was 2, 6, 10, and 14. The third subscale is the use of emotion (UOE) which is the ability of individuals to make use of emotions by directing them towards constructive activities and personal performance. The questions addressing the subscale of use of emotion were 3, 7, 11, and 15. The fourth subscale, the regulation of emotion (ROE) refers to the ability of individuals to regulate their emotions. The questions addressing the subscale of regulation of emotion were 4, 8, 12, and 16 (Wong & Law, 2002).

Table 2 presents frequencies and percentages of responses prior to simulation training to the four items constituting self-emotion appraisal (SEA). Displayed are levels of agreement for each of the four items related to the subscale. An analysis of the self-emotion appraisal subscale demonstrated that the majority of respondents agreed, moderately agreed, or strongly agreed with all four items in this subscale.

The combined respondents indicating agreement above neither agree or disagree responses was 85 (93.5%) for item 1 as to sense of feelings; 85 (93.5%) for item 5, addressing good understanding of emotions; 84 (94.1%) for item 9, understanding feelings, and 85 (93.4%) for item 13 as to individuals knowing whether or not they were happy.

A minority of respondents disagreed, moderately disagreed, or strongly disagreed with all four items in this subscale. The total numbers and percentages of respondents indicating moderately disagree, disagree, or strongly disagree for item 1 were 6 (6.6%), 4 (4.4%) for item 5, 4 (4.4%), for item 9, and 4 (4.4%) for item 13.

Table 2
Self-Emotion Appraisal Prior to Simulation

Descriptor (Item)	n	%
I have a good sense of why I have certain feelings most of the time (1)		
Strongly Agree	33	36.3
Agree	39	42.9
Moderately Agree	13	14.3
Neither Agree or Disagree	0	0.0
Moderately Disagree	1	1.1
Disagree	4	4.4
Strongly disagree	1	1.1
I have a good understanding of my emotions (5)		
Strongly Agree	23	25.3
Agree	48	52.7
Moderately Agree	13	14.3
Neither Agree or Disagree	3	3.3
Moderately Disagree	1	1.1
Disagree	2	2.2
Strongly Disagree	1	1.1
I really understand what I feel (9)		
Strongly Agree	13	14.3
Agree	47	53.4
Moderately Agree	24	26.4
Neither Agree or Disagree	3	3.3
Moderately Disagree	1	1.1
Disagree	3	3.3
Strongly Disagree	0	0.0
I always know whether or not I am happy (13)		
Strongly Agree	30	33.0
Agree	47	51.6
Moderately Agree	8	8.8
Neither Agree or Disagree	2	2.2
Moderately Disagree	0	0.0
Disagree	1	1.1
Strongly Disagree	2	2.2

Table 3 presents frequencies and percentages of responses prior to simulation training for the four items constituting others-emotion appraisal (OEA). Displayed are levels of agreement for each of the four items related to the subscale.

An analysis of the others-emotion appraisal subscale demonstrated that the majority of respondents agreed, moderately agreed, or strongly agreed with all four items in this subscale. The combined percentage of respondents indicating agreement above neither agree or disagree responses was 85 (93.5%) for item 2 as to knowing friends' emotions from their behavior; 85 (93.5%) for item 6, being a good observer of others' emotions; 84 (94.1%) for item 10 in regard to understanding feelings, and 85 (93.4%) for item 14 as to the individual's understanding the emotions of those around the respondent.

A minority of respondents disagreed, moderately disagreed, or strongly disagreed with all four items in this subscale. The total numbers and percentages of respondents indicating moderately disagree, disagree, or strongly disagree for item 2 were 6 (6.6%), 4 (4.4%) for item 6, 4 (4.4%), for item 10, and 5 (5.5%) for item 14.

Table 4 displays the analysis of the frequency distribution of the Use of Emotions subscale prior to simulation. A majority of respondents agreed, moderately agreed, or strongly agreed with all four items in this subscale.

Respondents indicating agreement above neither agree or disagree responses for item 3 in regard to setting and achieving goals was 88 (96.9%); 73 (80.3%) for item 7 in terms of believing in their competence; 88 (97.1%), for item 11as to being self-motivated; and 85 (93.5%) for item 15 which referred to their self-encouragement to succeed.

Table 3
Others-Emotion Appraisal Prior to Simulation

Descriptor (Item)	n	%
I always know my friends emotions from their behavior (2)		
Strongly Agree	12	13.2
Agree	29	31.9
Moderately Agree	38	41.8
Neither Agree or Disagree	4	4.4
Moderately Disagree	3	3.3
Disagree	3	3.3
Strongly disagree	0	0.0
I am a good observer of others emotions (6)		
Strongly Agree	21	23.1
Agree	40	44.0
Moderately Agree	4	4.4
Neither Agree or Disagree	3	3.3
Moderately Disagree	4	4.4
Disagree	0	0.0
Strongly Disagree	0	0.0
I am sensitive to the feelings and emotions of others (10)		
Strongly Agree	31	34.1
Agree	40	44.0
Moderately Agree	2	2.2
Neither Agree or Disagree	1	1.1
Moderately Disagree	2	2.2
Disagree	2	2.2
Strongly Disagree	0	0.0
I have a good understanding of the emotions of people around me (14)		
Strongly Agree	17	18.7
Agree	39	42.9
Moderately Agree	25	27.5
Neither Agree or Disagree	5	5.5
Moderately Disagree	4	4.4
Disagree	1	1.1
Strongly Disagree	0	0.0

Table 4
Use of Emotions Appraisal Prior to Simulation

Descriptor (Item)	n	%
I always set goals for myself and then try to do my best to achieve them (3)		
Strongly Agree	32	35.2
Agree	43	47.3
Moderately Agree	13	14.3
Neither Agree or Disagree	0	0.0
Moderately Disagree	1	1.1
Disagree	1	1.1
Strongly disagree	1	1.1
I always tell myself I am a competent person (7)		
Strongly Agree	14	15.4
Agree	39	42.9
Moderately Agree	20	22.0
Neither Agree or Disagree	9	9.9
Moderately Disagree	3	3.3
Disagree	4	4.4
Strongly Disagree	0	0.0
I am a self-motivated person (11)		
Strongly Agree	42	46.5
Agree	29	31.9
Moderately Agree	17	18.7
Neither Agree or Disagree	1	1.1
Moderately Disagree	2	2.2
Disagree	1	1.1
Strongly Disagree	0	0.0
I would always encourage myself to try my best (15)		
Strongly Agree	38	41.8
Agree	37	40.7
Moderately Agree	10	11.0
Neither Agree or Disagree	4	4.4
Moderately Disagree	0	0.0
Disagree	0	0.0
Strongly Disagree	2	2.2

A minority of respondents disagreed, moderately disagreed, or strongly disagreed with all four items in this subscale. The total numbers and percentages of respondents indicating disagreement below neither agree or disagree responses for item 3 were 3 (3.3%), 7 (7.7%) for item 7, 2 (2.2%), for item 11, and 2 (2.2%) for item 15.

The frequency and percentage data for items associated with the regulation of emotion subscale prior to simulation is presented in Table 5. Consistent with prior subscales, these data demonstrated that the majority of respondents agreed, moderately agreed, or strongly agreed with all four items in this subscale. The combined frequencies and percentages of respondents indicating agreement above neither agree or disagree responses for item 4 which refers to controlling temper and handling emotions was 76 (83.5%). In regard to item 8 capability of controlling their own emotions, the combined responses were 85 (83.3%) for item 8; for item 12 relating to calming down quickly when angered, the responses were 75 (82.5%). For item 16, which focused on good control of emotions, the combined responses were 84 (92.3%).

A minority of respondents disagreed, moderately disagreed, or strongly disagreed with all four items in this subscale. The total numbers and percentages of respondents indicating moderately disagree, disagree, or strongly disagree for item 4 were 8 (8.8%); 7 (7.7%) for item 8; 10 (11%), for item 12; and 6 (6.6%) for item 16.

Table 5
Regulation of Emotions Appraisal Prior to Simulation

Descriptor (Item)	n	%
I am able to control my temper and handle emotions rationally (4)		
Strongly Agree	15	16.5
Agree	46	50.5
Moderately Agree	15	16.5
Neither Agree or Disagree	7	7.7
Moderately Disagree	5	5.5
Disagree	3	3.3
Strongly disagree	0	0.0
I am quite capable of controlling my own emotions (8)		
Strongly Agree	19	20.9
Agree	49	53.8
Moderately Agree	17	18.7
Neither Agree or Disagree	7	7.7
Moderately Disagree	3	3.3
Disagree	2	2.2
Strongly Disagree	2	2.2
I can always calm down quickly when I get angry (12)		
Strongly Agree	19	20.9
Agree	27	29.7
Moderately Agree	29	31.9
Neither Agree or Disagree	5	5.5
Moderately Disagree	8	8.8
Disagree	2	2.2
Strongly Disagree	0	0.0
I have good control of my emotions (16)		
Strongly Agree	15	16.5
Agree	48	52.7
Moderately Agree	21	23.1
Neither Agree or Disagree	1	1.1
Moderately Disagree	4	4.4
Disagree	2	2.2
Strongly Disagree	0	0.0

Summary of Research Question 1

There were 1,456 potential respondent values (91 x 16 = 1,456) which could be recorded during the first survey administration prior to completing the simulation. The largest group, 637 (43.8%) of the responses, indicated respondents agreed with items. The second largest group of 374 (25.7%) expressed strong agreement by respondents. The third largest group of responses, 298 (20.1%) revealed a moderate level of agreement. Significantly smaller groups, 47 (3.2%) neither agreed nor disagreed; 41 (2.8%) disagreed; 22 (1.5%) moderately disagreed; and 7 (.05%) strongly disagreed.

Table 6
Respondents' Levels of Agreement Prior to Simulation Participation

Responses	n	%
Strongly Agree	374	25.7
Agree	637	43.8
Moderately Agree	298	20.1
Neither Agree or Disagree	47	3.2
Moderately Disagree	41	2.8
Disagree	22	1.5
Strongly disagree	7	.05

Research Question 2

The second research question asked the respondents how they perceived their feelings after participating in a leadership simulation.

Table 7 presents frequencies and percentages of responses after simulation training to the four items constituting self-emotion appraisal (SEA). Displayed are levels of agreement for each of the four items related to the subscale.

Table 7
Self-Emotion Appraisal after Simulation

Descriptor (Item)	n	%
I have a good sense of why I have certain feelings most of the time (1)		
Strongly Agree	34	49.5
Agree	45	37.4
Moderately Agree	8	8.8
Neither Agree or Disagree	2	2.2
Moderately Disagree	1	1.1
Disagree	1	1.1
Strongly disagree	0	0.0
I have a good understanding of my emotions (5)		
Strongly Agree	33	36.3
Agree	39	42.9
Moderately Agree	13	14.3
Neither Agree or Disagree	0	0.0
Moderately Disagree	1	1.1
Disagree	4	4.4
Strongly Disagree	1	1.1
I really understand what I feel (9)		
Strongly Agree	13	14.3
Agree	47	53.4
Moderately Agree	24	26.4
Neither Agree or Disagree	3	3.3
Moderately Disagree	1	1.1
Disagree	3	3.3
Strongly Disagree	0	0.0
I always know whether or not I am happy (13)		
Strongly Agree	30	33.0
Agree	47	51.6
Moderately Agree	8	8.8
Neither Agree or Disagree	2	2.2
Moderately Disagree	0	0.0
Disagree	1	1.1
Strongly Disagree	2	2.2

An analysis of the self-emotion appraisal subscale demonstrated that the majority of respondents agreed, moderately agreed, or strongly agreed with all four items in this subscale. The combined percentage of respondents indicating agreement above neither agree or disagree responses was 87 (95.7%) for item 1, sense of feelings; 85 (93.5%) for item 5 addressing good understanding of emotions; 84 (94.1%) in regard to item 9 understanding feelings, and 85 (93.4%) for item 13, individuals knowing whether or not they were happy.

A minority of respondents disagreed, moderately disagreed, or strongly disagreed with all four items in this subscale. The total numbers and percentages of respondents indicating disagreement below neither agree or disagree for item 1 were 2 (2.2%); 2 (5.5%) for item 5; 4 (4.4%), for item 9, and 3 (3.3%) for item 13.

Table 8 presents frequencies and percentages of responses after simulation training to the four items constituting other-emotion appraisal (OEA). Displayed are levels of agreement for each of the four items related to the subscale.

An analysis of the other-emotion appraisal subscale demonstrated that the majority of respondents agreed, moderately agreed, or strongly agreed with all four items in this subscale. The combined percentage of respondents indicating agreement above neither agree or disagree responses was 84 (92.3%) for item 2 as to knowing friends emotions from their behavior; 86 (94.6%) for item 6 relating to being a good observer of others emotions; 88 (96.8%) for item 10 in regard to understanding feelings, and 85 (93.5%) for item 14 as to individuals' understanding the emotions of those around the respondent.

Table 8
Others-Emotion Appraisal after Simulation

Descriptor (Item)	n	%
I always know my friends emotions from their behavior (2)		
Strongly Agree	47	51.6
Agree	35	38.5
Moderately Agree	2	2.2
Neither Agree or Disagree	4	4.4
Moderately Disagree	2	2.2
Disagree	1	1.1
Strongly disagree	0	0.0
I am a good observer of others emotions (6)		
Strongly Agree	24	26.4
Agree	41	45.1
Moderately Agree	21	23.1
Neither Agree or Disagree	4	4.4
Moderately Disagree	1	1.1
Disagree	0	0.0
Strongly Disagree	0	0.0
I am sensitive to the feelings and emotions of others (10)		
Strongly Agree	38	41.8
Agree	39	42.9
Moderately Agree	11	12.1
Neither Agree or Disagree	2	2.2
Moderately Disagree	1	1.1
Disagree	0	0.0
Strongly Disagree	0	0.0
I have a good understanding of the emotions of people around me (14)		
Strongly Agree	23	25.3
Agree	42	46.2
Moderately Agree	20	22.0
Neither Agree or Disagree	4	4.4
Moderately Disagree	2	2.2
Disagree	0	0.0
Strongly Disagree	0	0.0

A minority of respondents disagreed, moderately disagreed, or strongly disagreed with all four items in this subscale. The total numbers and percentages of respondents indicating moderately disagree, disagree, or strongly disagree item 2 were 3 (3.3%); 1 (1.1%) for item 6; 1 (1.1%) for item 10; and 2 (2.2%) for item 14.

The analysis of the frequency distribution of the subscale, Use of Emotions after simulation, Table 9, reveals that the majority of respondents agreed, moderately agreed, or strongly agreed with all four questions in this subscale. The total numbers and percentages of respondents indicating agreement above neither agree or disagree were: for item 3 in regard to setting and achieving goals, 89 (97.6%); for item 7 in terms of believing in their competence, 79 (86.9%); for item 11 self-motivation, 89 (97.9%); and for item 15 which addressed self-encouragement to succeed, 86 (95.7%).

A minority of respondents disagreed, moderately disagreed, or strongly disagreed with all four items in this subscale. The total numbers and percentages of responses indicating moderately disagree, disagree, or strongly disagree for item 3 were 1 (1.1%); 3 (3.3%) for item 7; 0 (0.0%), for item 11; and 2 (2.2%) for item 15.

The frequency distribution data on regulation of emotion subscale after simulation questions is presented in Table 10.This analysis again demonstrated that the majority of respondents agreed, moderately agreed, or strongly agreed with all four questions in this subscale.

Table 9
Use of Emotions after Simulation

Descriptor (Item)	n	%
I always set goals for myself and then try to do my best to achieve them (3)		
Strongly Agree	37	40.7
Agree	42	46.2
Moderately Agree	10	11.0
Neither Agree or Disagree	1	1.1
Moderately Disagree	1	1.1
Disagree	0	0.0
Strongly disagree	0	0.0
I always tell myself I am a competent person (7)		
Strongly Agree	21	23.1
Agree	37	40.7
Moderately Agree	21	23.1
Neither Agree or Disagree	9	9.9
Moderately Disagree	1	1.1
Disagree	2	2.2
Strongly Disagree	0	0.0
I am a self-motivated person (11)		
Strongly Agree	36	39.6
Agree	42	46.2
Moderately Agree	11	12.1
Neither Agree or Disagree	2	2.2
Moderately Disagree	0	0.0
Disagree	0	0.0
Strongly Disagree	0	0.0
I would always encourage myself to try my best (15)		
Strongly Agree	41	45.1
Agree	41	45.1
Moderately Agree	4	5.5
Neither Agree or Disagree	3	3.3
Moderately Disagree	1	1.1
Disagree	1	1.1
Strongly Disagree	0	0.0

Table 10
Regulation of Emotions after Simulation

Descriptor (Item)	n	%
I am able to control my temper and handle emotions rationally (4)		
Strongly Agree	25	27.5
Agree	46	50.5
Moderately Agree	16	17.6
Neither Agree or Disagree	3	3.3
Moderately Disagree	1	1.1
Disagree	0	0.0
Strongly disagree	0	0.0
I am quite capable of controlling my own emotions (8)		
Strongly Agree	24	26.4
Agree	49	53.8
Moderately Agree	14	18.7
Neither Agree or Disagree	2	2.2
Moderately Disagree	2	2.2
Disagree	0	0.0
Strongly Disagree	0	0.0
I can always calm down quickly when I get angry (12)		
Strongly Agree	22	24.2
Agree	37	40.7
Moderately Agree	19	20.9
Neither Agree or Disagree	7	7.7
Moderately Disagree	6	6.6
Disagree	0	0.0
Strongly Disagree	0	0.0
I have good control of my emotions (16)		
Strongly Agree	27	29.7
Agree	46	50.5
Moderately Agree	12	13.2
Neither Agree or Disagree	1	1.1
Moderately Disagree	5	5.5
Disagree	0	0.0
Strongly Disagree	0	0.0

The total numbers and percentages of the respondents indicating agreement above neither agree or disagree for item 4 which referred to controlling temper and handling emotions was 87 (95.6%); for item 8, capability of controlling one's own emotions, combined responses were 87 (98.6%); for item 12 related to calming down quickly when angered, 78 (85.8%); for item 16 as to good control of emotions, combined responses totaled 85 (93.4%).

A minority of respondents disagreed, moderately disagreed, or strongly disagreed with all four items in this subscale. The total numbers and percentages of the respondents indicating moderately disagree, disagree, or strongly disagree for item 4 were 1 (1.1%); 2 (2.2%) for item 8; 6 (6.6%) for item 12; and 5 (5.5%) for item 16.

The combined moderately disagree and neither agree or disagree responses of 13 (14.3%) of respondents to item 12, "I always calm down when I get angry" was somewhat noteworthy in reviewing the data.

Summary of Research Question 2

There were 1,456 potential respondent values (91 x 16 = 1,456) which could be recorded during the second administration of the WLEIS after completing the simulation. These values are shown in Table 11. The largest group, 657 (45%) of the respondents indicated that they agreed with the statements posed to them in the survey. The second largest group of 469 responses or (32%) strongly agreed with items. The third largest group of responses, 241 (16.6%), revealed moderate levels of agreement with items. Significantly smaller groups indicated their levels of disagreement with the statements. A

total of 53 (3.6%) neither agreed or disagreed; 28 (1.9%) disagreed; 7 (.004%) moderately disagreed; and only 1 individual (.0006%) strongly disagreed.

Table 11
Respondent Values after Participating in the Leadership Simulation

Responses	n	%
Strongly Agree	469	32.0
Agree	657	45.0
Moderately Agree	241	16.6
Neither Agree or Disagree	53	3.6
Moderately Disagree	28	1.9
Disagree	7	.004
Strongly disagree	1	.0006

Research Question 3

The third research question tested for significant differences between the measures of emotional intelligence reported in Research Question 1 and the measures of emotional intelligence reported in Research Question 2. These measures were grouped for analysis by response questions to the corresponding emotional intelligence constructs. As outlined in Research Question 1, the four emotional intelligence constructs are (a) self-emotion appraisal (SEA), (b) others-emotion appraisal (OEA), (c) use of emotion (UOE), and (d) regulation of emotion ROE.

A paired-samples t-test was used to compare the means of the participant responses from the first survey administration prior to participants' participation in the leadership simulation with responses recorded during the second administration of the survey after participation in a leadership simulation. These responses were grouped by the four emotional intelligence constructs mentioned earlier: SEA, OEA, UOE and ROE.

The alpha level was set at .05; thus the probability value for significance (2-tailed) was required to have a value of less than .05.

The results of the paired-samples t-test are presented in Table 12.There was a significant increase in respondent scores in three of the four subscales after the respondents participated in the Virtual Leader simulation: (a) self-emotion appraisal (SEA), p = .031; (b) others emotion appraisal (OEA), p = .002; and (c) regulation of emotion (ROE), p = .002. The emotional intelligence construct, use of emotion (UOE), p = .061, did not demonstrate statistical significance.

Table 12
Paired Samples t-test

Comparison Pairs	Mean	Standard Deviation	Standard Error of the Mean	t	Sig. 2-tailed
OEA 1 and OEA 2	.9780	2.93628	.30781	3.177	.002*
UOE 1 and UOE 2	.7363	3.70536	.38843	1.896	.061
ROE 1 and ROE 2	1.2747	3.86456	.40512	3.147	.002*
SEA 1 and SEA 2	.7912	3.44969	.36163	2.188	.031*

Note: df = 90. * = p < .05. SEA = Self-Emotion Appraisal, OEA = Others-Emotion Appraisal, UOE = Use of Emotion, ROE = Regulation of Emotion.

An analysis of the means was performed on the three scales showing significance of less than the alpha of .05. The results are displayed in Table 13.The first subscale, Self-Emotion Appraisal (SEA), had a mean of 23.4835 prior to participation in the simulation and a mean of 24.2747 after participating in the simulation indicating an increase in self-appraisal emotional intelligence scores after the simulation. The second subscale, Others-Emotion Appraisal (OEA), had a mean of 22.6923 prior to participation in the simulation and a mean of 23.6703 after participating in the simulation indicating an

increase in appraisal of others' emotions scores after the simulation. Finally, the third subscale, Regulation of Emotion (ROE), had a mean of 22.3846 prior to participation in the simulation and a mean of 23.6593 after participating in the simulation indicating an increase in self-regulation of emotions scores after the simulation.

Table 13
Analysis of the Means

Paired Samples	Mean	N	Standard Deviation	Standard Error of the Mean
Pair 1				
SEA 1	23.4835	91	4.08619	.42835
SEA 2	23.2747	91	3.22168	.33772
Pair 2				
OEA 1	22.6923	91	3.61691	.37916
OEA 2	23.6703	91	2.79704	.29321
Pair 3				
ROE 1	22.3846	91	3.98823	.41808
ROE 2	23.6593	91	3.11348	.32638

Note. SEA = Self-Emotion Appraisal, OEA = Others-Emotion Appraisal, UOE = Use of Emotion, ROE = Regulation of Emotion.

In order to determine the magnitude of the intervention effect, Eta squared was calculated to determine effect size. Eta squared can be interpreted in the following manner, .01 = small effect, .06 = moderate effect, .14 = large effect (Cohen 1988, as cited in Pallant, 2006). The three subscales showing p values less than .05 were selected for Eta squared analysis.

The Eta squared for SEA was .05, which indicated that there was a low moderate effect upon self-emotion appraisal after participating in the Virtual Leader simulation. The Eta squared for ROE was .10 indicating there was a high moderate effect upon

regulation of emotion after participating in the Virtual Leader simulation. The Eta squared for OEA was .10 indicating there was a high moderate effect upon others-emotion appraisal after participating in the Virtual Leader simulation.

Summary of Research Question 3

The four constructs of emotional intelligence were evaluated using a paired-samples t-test. This test indicated that there was a significant increase in respondent scores: self-emotion appraisal (SEA), $p = .031$; others-emotion appraisal (OEA), $p = .002$; and regulation of emotion (ROE), $p = .002$; after respondents participated in the Virtual Leader simulation. The emotional intelligence construct, use of emotion, had a value of $p = .061$ and did not demonstrate statistical significance.

Research Question 4

The fourth research question tested for statistically significant differences in participants' ratings of their emotional intelligence skills by race, age, years employed, student or employee, gender, position type, length of time employed by the institution, or amount of time participating in the institution's leadership development program prior to participation in a simulation based leadership training program.

The five categorical variables reported in this analysis (age, race, gender, years employed, and position type) were compared with the dependent variable, time, as compared to the response differences before and after participation in the Virtual Leader simulation. The dependent variables were grouped into the four constructs of emotional intelligence and compared before and after simulation training. The labels were the

following: SEA 1, SEA 2, OEA 1, OEA 2, UOE 1, UOE 2, and ROE 1, ROE 2. A one-way repeated measures ANOVA was employed to conduct this analysis, with an alpha level of .05.

The Wilks Lambda multivariate test of the mean differences between two or more groups was used for the analysis. For an item to be considered significant in this study, it must have a p value of less than .05. The Wilks Lambda values of the items ranged from .357 to 1.00, and the corresponding p values ranged from .002 to .999. All combinations of the categorical variables (age, race, gender, years employed, and position types) were compared to the value labeled *time*. The only effect p value that was statistically significant was the effect time. The p value of >.002 indicated that there was a change in respondents' emotional intelligence scores between the first and second administrations of the survey instruments. The Partial Eta squared value of the effect time was .473. Using the guidelines proposed by Cohen (1998) where .01 =small, .06= moderate, and.14 = large, this value suggested a large effect size. The complete results of the Wilks Lambda multivariate test of mean differences are contained in Appendix E.

Summary of Research Question 4

All combinations of the categorical variables (age, race, gender, years employed, and position types) were compared to the value labeled time. There was a significant effect for time in the participant rating of emotional intelligence before and after participation in the Virtual Leader simulation. The results of the repeated measures analysis of variance (ANOVA) identified a significant difference between the first

administration of the survey and the second administration after participation in the Virtual Leader simulation. The p value of the Wilks Lambda tests was .002 with a multivariate partial eta squared effect of .473. A large effect such as this, according to Cohen (1998), indicates gains in emotional intelligence after participating in the simulation.

Summary

In this chapter participants were described in terms of the demographic information they provided. To answer Research Questions 1 and 2, the respondents' ratings of their level of emotional intelligence derived from the literature and a survey instrument developed by Wong and Law (2002) were described and discussed. Respondents' rankings were presented for each question, grouped by subscale, and comprehensively by total response for Research Questions 1 and 2.

To answer Research Question 3, a paired-samples t-test was utilized to evaluate the four constructs of emotional intelligence. A statistically significant increase in post simulation scores was discovered for: self-emotion appraisal (SEA), $p = .031$; others-emotion appraisal (OEA), $p = .002$; and regulation of emotion (ROE), $p = .002$.

In Research Question 4, the one-way repeated measures ANOVA evaluating all combinations of the categorical variables (age, race, gender, years employed, and position types compared to the value labeled time) resulted with the effect time as the only statistically significant effect. Time was the difference between respondent scores

before and after participating in the leadership simulation. The Partial Eta squared value of the effect time was .473, which suggested a large effect size.

CHAPTER 5
SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Introduction

In the early 1900s, the study of leadership was focused upon individual and personal traits following the assumption that leaders were born not made. This possession of a unique combination of physical, mental, and social characteristics that made up a leader was thought to be the product of heredity as opposed to experience (McCall, 1998; Pearce & Manz, 2005; Stodgill, 1974). These early studies attempted to quantify personal attributes and talents that were present in high performing leaders with the hope of replicating those traits in order to develop other leaders. These studies focused upon the persona that made a leader great and centered upon a leader's individual characteristics or traits (Jones & Moser, 2001).

Beginning in the 1930s and through the late 1940s, a group of leader traits and behavior categories began to emerge in which different leadership behaviors were grouped. This, coupled with the development of substantiated personality theories and measurement theory that possessed specific operational definitions, helped quantify the examination of leaders' actions and how leaders project influence over individuals (House & Aditya, 1997). These characteristics are important because leaders are recognized by the behaviors they exhibit and those behaviors' influence over others. It is essential that leaders have a high level of understanding about their own leadership traits and characteristics of good leadership since leadership relies on human interaction. Bennis (1994) also noted that these were traits that could be learned or changed.

Many definitions of leadership were identified in the literature review conducted for this study. For example, Chemers (1997) stated, “Leadership is a process of social influence in which one person is able to enlist the aid and support of others in the accomplishment of a common task” (p. 1). Leadership has also been defined as influencing activities by individuals or group members that significantly contribute to “development and maintenance of role structure and goal direction necessary for effective group performance” (Bass & Stodgill, 1990, p. 411). Bass, Stodgill, and Chemers focused on a delicately crafted relationship between leaders and followers and the ability of leaders to influence followers.

Some of the aspects of effectively building and managing complex social relationships in the workplace are components of the theory of emotional intelligence. As noted in the earlier literature review, emotional intelligence is “the ability to perceive emotion, integrate emotion to facilitate thought, understand emotions and regulate emotions, and to promote personal growth” (Meyer & Salovey, 1997, p. 101). Emotional intelligence can also be described as being aware of, or understanding yourself and others in relating to people and adapting to varying daily situations (Bar-On, 1997).

Developing leadership skills and leaders traditionally has been accomplished through a combination of on-the-job and classroom training. Unfortunately, in on-the-job training a mistake in how a leader resolves a situation could have long-term negative repercussions. Therefore, a major challenge in leadership training has been the design of a process that allows leaders to practice to become more skilled in these complex social roles and skills identified in the literature theory and to make mistakes without alienating

their workplace peers and supervisors. One emerging solution has been the use of computer-based simulations that allow leaders to practice and improve these skills in a private setting.

Summary of the Findings

This research study was conducted in an attempt to identify gains in emotional intelligence that are related to the relationship oriented or transformational approach practiced by effective leaders (Conger & Kanungo, 1998; House & Aditya, 1997; Keller 2006; Uhl-Bien, 2003). Introductory management classes in the BAS program, introductory business principles classes in the BUS program, and the leadership development cohort at Daytona Beach Community College were invited to participate.

A participant in the Virtual Leader simulation from the sample population of BAS, BUS, and leadership development participants was most likely to be a white female who self reported employment classification as being professional, administrative, or clerical. Additionally, this person was most likely to be between 34 and 47 years of age and had been employed in his or her current position between 1 and 10 years.

The purpose of this study was to examine the relationship between participation in the virtual leader computer based leadership simulation-training program and the participants' self-perceived changes in emotional intelligence behaviors. This study also analyzed for statistically significant differences in the means of self-perceived emotional intelligence when compared to age, race, gender, position type, and length of time employed.

Summary of Research Question 1

How do members of a leadership training or student cohort rate their emotional intelligence skills prior to participation in simulation based leadership training?

Interestingly, the grouping of scores associated with emotional intelligence self-ratings prior to participating in the simulation suggested that participants in general held a primarily positive view of their emotional intelligence skills. This may not be uncommon given the demographics of the respondents. Higher levels of emotional intelligence have been positively correlated with good workplace performance in areas such as participative management, change management, putting people at ease, building and mending relationships, self awareness, straightforwardness, and composure (Ruderman, Hannum, & Steed, 2003; Schutte et al., 2001). Additionally, emotional intelligence has been linked to increased employee job satisfaction and leadership emergence (Ashkanasy & Dasborough, 2003). These skills would be evident in persons personally selected by their supervisors or companies to participate in a leadership development program and who have been employed in their current positions between 1 and 10 years.

Summary of Research Question 2

How do members of a leadership training or student cohort rate their emotional intelligence skills after participating in simulation based leadership training?

In general, the respondents' assessment of their own emotional intelligence after participation in the simulation was also very high. As identified in the literature review, simulations allow behavior to be studied as it occurs. The trainee also has opportunities to evaluate and modify complex behaviors leading to performance (Brenestuhl, Catalanello,

Faria, 2001). By providing immediate feedback on continuous or intermittent schedules, participants in this study were able to test multiple contents in different contexts and rehearse strategies that allowed them the freedom to respond in ways not acceptable in the workplace (Aldrich, 2002; Boser, 2002; Foreman, 2004). The results of this simulation suggested that the ability to receive instant feedback on the success or failure of a particular strategy led to self- perceived behavioral changes related to emotional intelligence.

Summary of Research Question 3

Is there a statistically significant difference in participants' rating of their emotional intelligence skills after participating in simulation based leadership training?

Emotional intelligence can be divided into four separate constructs as suggested in the literature. Each of these constructs can be considered learned behavior with gains in the ability determined by both predisposition and practice. The four constructs of emotional intelligence are self-awareness, self-management, social awareness, and relationship management. Self-awareness is the ability to read and recognize one's emotions to guide decisions. Self-management is the ability to control one's emotions and impulses while adapting to changing circumstances. Social awareness is the ability to recognize, understand, and respond to others' emotions in social or organizational settings. Relationship management is the ability to influence, inspire, and develop others and manage conflict (Goleman, 1995).

Each of Goleman's (1995) constructs was evaluated using Wong and Law's emotional intelligence survey. Although slightly different in description, both Goleman

and Wong and Law have been in agreement as to the constructs of emotional intelligence. The four emotional intelligence constructs examined using the Wong and Law survey are: (a) self-emotion appraisal (SEA), (b) others-emotion appraisal (OEA), (c) use of emotion (UOE), and (d) regulation of emotion (ROE).

These four constructs of emotional intelligence were evaluated using a paired-samples t-test to compare emotional intelligence scores before and after participation in the Virtual Leader simulation. This test indicated that there was a significant increase in respondents' scores after participating in the Virtual Leader simulation in self-emotion appraisal (SEA), $p = .031$; others-emotion appraisal (OEA), $p = .002$; and regulation of emotion (ROE), $p = .002$. The emotional intelligence construct, use of emotion (UOE), had a value of $p = .061$ and did not demonstrate statistical significance.

Studies suggest that leaders who do not understand the emotional states of others or fail to develop the situational awareness of others' emotional states are very likely to fail in the workplace (Fiest & Barron, 1996). Leaders who exhibit low levels of emotional intelligence can be identified by a lack of awareness of their own and others emotions, the inability to handle stress, and angering easily. All of these characteristics could lead to poor workplace performance (Ruderman, Hannum, & Steed, 2003: Schutte et al., 2003).

Additionally, Daus & Ashkanasy (2005), in their studies of the relationship between transformational leadership, leader emergence, and emotional intelligence, found that higher levels of emotional intelligence predicted leader emergence and were related to transformational leadership. Emotional intelligence has also been linked with

increased employee job satisfaction, group performance, and leadership emergence (Ashkanasy, 2005; Ashkanasy & Dasborough, 2003). Positive correlations between high levels of the understanding emotions factor of emotional intelligence and transformational leadership have been identified through research (Askkanasy, 2004; Ashkanasy & Dasborough, 2003; Daus & Ashkanasy, 2005).

As summarized in the literature review for this project, Feist & Barron (1996) conducted a longitudinal study of graduate students prior to beginning their careers and later in their careers to determine factors that contributed to their success. They determined that levels of emotional intelligence were indicators of an individual's ability to adapt to change and develop effective workplace relationships. They concluded that social and emotional abilities were four times more important than IQ when determining success and prestige (Feist & Barron, 1996).

The ability to provide leaders the opportunity to practice these emotional intelligence skills and make learning gains is a desirable outcome when training leaders, especially when the practice can take place in an off-line setting. This simulation of experience allows participants to draw upon both prior learning and experience do develop new skills, thus providing a deeper and more comprehensive learning experience (Kayes, Fulmer & Stumpf, 1996; Keys & Wolfe, 1990).

The analysis in the present study indicated that participants were able to increase their emotional intelligence perceptions and skills through their participation in the simulation. This result is in agreement with the findings of Foreman (2004) and Boser (2002) that the ability to adjust the reality of a simulation to improve outcomes gave

participants the ability to repeatedly practice and reinforces successful strategies. Additionally, computer based simulations allow a participant to utilize multiple iterations and permutations of a training exercise and to receive instant feedback on a particular strategy's success or failure (Aldrich, 2002).

These emotional intelligence skill gains demonstrate that in a relatively short period of time participants in the Virtual Leader simulation improved these leadership related behaviors. Additionally the research indicated that the gains were universal to all participants, not just a handful of lower initial performers. These results were also supportive of the findings of prior researchers that emotional intelligence is a learned behavior that can be improved with practice.

Summary of Research Question 4

Is there a statistically significant difference in participants' ratings of their emotional intelligence skills by race, age, years employed, gender or position type.

A premise of emotional intelligence is that it is non-specific to certain important characteristics of leaders and can be a learned behavior. Past research has shown that emotional intelligence is not specific to race, gender, age, experience, or position type (Bradberry et al., 2003; Stys & Brown, 2004). All possible combinations of the categorical variables of age, race, gender, years employed, and position types were compared to the value labeled *time,* which were the pre- to post- simulation emotional intelligence scores. The results of the repeated measures analysis of variance indicated that there was a significant statistical effect for *time* in the participant ratings of emotional intelligence before and after participation in the Virtual Leader simulation. These results

confirm the conclusions identified in the literature review that emotional intelligence is both non-specific and can be learned through trial and practice.

Implications for Practice

Experienced educational leaders have recognized the importance of developing leadership skills within their organizations. The pending retirement of significant percentages of community college presidents and their senior staff within the next 10 years has created a focus on developing the next generation of educational leaders (Shults, 2001; Vaughn & Weisman, 2001).

Traditionally, leadership skills have been developed through a combination of practical experiences, mentoring, and formal training. The leadership skills related to building effective workplace relationships and the appropriate exercise of influence could be imparted and practiced with simulations. A well-designed simulation provides a participant the opportunity to practice a scenario through multiple iterations to reinforce learning. These simulations range from paper based or instructor driven to computer and web based. The common thread driving the use of simulations is the need of organizations to compensate for scarce financial and personnel resources (Degnan, 2000; Faria, 1984).

This study focused upon measurement of learning gains in the leadership skills related to emotional intelligence as the result of participating in the Virtual Leader simulation. Those leadership and emotional intelligence skills related to relationship and influence development were individually practiced over multiple iterations in a

computerized environment laden with workplace context. Participants demonstrated statistically significant gains in their emotional intelligence scores after participating in the simulation.

The participants' post-simulation gain in emotional intelligence has implications for educational leaders. Given the convenience of this computer-based simulation, an educational entity could use this tool to screen applicants for positions requiring the exercise of leadership skills (Wright, 1993). The Virtual Leader simulation can serve as a diagnostic tool to help an organization develop the correct training plan and methodology for new and existing employees. Participant performance in the simulation also could serve as an indicator of the need for more intensive training and mentoring for the rapid development of leadership skills. This training tool also provides a means to standardize the leadership training experience, thus allowing a participant the ability to practice a skill set within the same set of simulated organizational conditions. These repeatable training conditions allow the participant to focus on a specific leadership skill set or situation without the distractions or changing context of the real life experience.

Finally, a participant has the ability to privately practice and reinforce leadership skills, styles, and tactics, which may be significantly different from their usual approach in order to modify their personal style and to understand weaknesses in other styles and approaches. For example, a participative leader could privately practice an autocratic style inside of the Virtual Leader simulation as a means of exploring and understanding this style. This can provide a leader insight into their personal leadership style and help that leader understand and more effectively communicate with other leaders.

This study contributes to existing research in that it opens a path of inquiry related to the link between leadership, emotional intelligence, and the use of computer based simulation to improve these skills.

Suggestions for Further Research

To further advance the body of knowledge as it pertains to leadership development, emotional intelligence, and training simulations it would be beneficial to conduct other studies as follows:

1. Further research is suggested to identify how quickly participants in leadership simulations demonstrate learning gains concerning development of emotional intelligence skills when compared to other methods of developing these skills.
2. Conduct a study of the real-world application of the emotional intelligence skills gained through simulation.
3. A longitudinal study on the correlation between emotional intelligence skills to career success is recommended. An understanding of how these skills translate into longer-term success could help develop increased awareness of both the importance of these skills and the efficiency of enhancing these skills through simulation.
4. A larger replication of the study is suggested to assess emotional intelligence skill acquisition across a larger percentage of the student population.
5. Develop a study to compare and contrast the impact of simulation as a process to train emotional intelligence in both educational and corporate settings.

APPENDIX A
INSTITUTIONAL REVIEW BOARD APPROVAL

THE UNIVERSITY OF CENTRAL FLORIDA
INSTITUTIONAL REVIEW BOARD (IRB)

IRB Committee Approval Form

#06-3659

PRINCIPAL INVESTIGATOR(S): Stanley Sidor
(Supervisor – Jess House, Ph.D.)

PROJECT TITLE: The Impact of Computer Based Simulation Training on Leadership Development

[X] New project submission [ ] Resubmission of lapsed project
[ ] Continuing review of lapsed project [ ] Continuing review of #
[ ] Study expires [ ] Initial submission was approved by expedited review
[ ] Initial submission was approved by full board review but continuing review can be expedited
[ ] Suspension of enrollment email sent to PI, entered on spreadsheet, administration notified _____

Chair
[X] Expedited Approval

Dated: 9/4/06
Cite how qualifies for expedited review:
minimal risk and #7

[ ] Exempt

Dated: _____
Cite how qualifies for exempt status:
minimal risk and _____

[X] Expiration Date: 9/3/07

IRB Reviewers:

Signed: _____
Dr. Sophia Dziegielewski, Vice-Chair

Signed: _____
Dr. Jacqueline Byers, Chair

Signed: _____
Dr. Tracy Dietz, Vice-Chair

Complete reverse side of expedited or exempt form
[ ] Waiver of documentation of consent approved
[ ] Waiver of consent approved
[ ] Waiver of HIPAA Authorization approved

NOTES FROM IRB CHAIR (IF APPLICABLE): First Review - clarifications need. 8/13/06

APPENDIX B
INFORMED CONSENT

Dear Participant:

I am graduate student at the University Central Florida. As part of my dissertation I am administering a questionnaire, the purpose of which is to learn about how leadership students perceive their emotional intelligence abilities before and after a web based training. I am asking you to participate in this questionnaire because you have been identified as a leadership training participant.

Participants will be asked to complete a questionnaire before and after participating in web based leadership training as part of your classroom experience. The questionnaire attached to this letter should take no longer than 15 minutes to complete. You will not have to answer any question you do not wish to answer. Only I will have access to the questionnaire the results of which I will personally enter in a statistical analysis program removing any identifiers during entry. The questionnaire will then be shredded. Your identity will be kept confidential to the extent provided by law and your identity will not be revealed in the final dissertation.
There are no anticipated risks, compensation or other direct benefits to you as a participant. You are free to withdraw your consent to participate and may discontinue your participation in this project at any time without consequence.

If you have any questions about this research protocol, please feel free to contact me.

Phone (386) 447-2717, e-mail: sidors@dbcc.edu
Stanley M. Sidor
13 Coral Reef Court
Palm Coast FL 32137

Or my faculty advisor:

Dr. Jess House
e-mail: jhouse@mail.ucf.edu
University of Central Florida
College Of Education
Educational leadership/Higher Ed. & Policy Studies ED 223M
Orlando, FL 32816-1250

Please sign and return this copy of the letter in the enclosed envelope. A second copy is provided for your records. By signing this letter, you give me permission to report your responses anonymously in the final manuscript to be submitted to dissertation advisor.
Stan Sidor

I have read the procedure described above for the leadership training questionnaire. I voluntarily agree to complete the questionnaire and I have received a copy of this description.

_____ _____
Signature of participant Date

Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional review Board (IRB). Questions or concerns about the research participants rights may be directed to: UCF Institutional Review Board Office, Office of Research and Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246. The phone numbers are: (407) 823-2901 or (407) 882-2276

APPENDIX C
EMOTIONAL INTELLIGENCE QUESTIONNAIRE

Emotional Intelligence Questionnaire

This survey is part of a research project examining the relationship between emotional intelligence and participation in a web-based leadership simulation.

Name:_____

Demographic Information		Female	Male	African American	Hispanic	Asian or Pacific Islander	Alaskan or Native American	Caucasian
		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Position Type	Administrative	Career	Faculty	Professional	Clerical	Service	Self Employed	
	☐	☐	☐	☐	☐	☐	☐	
Age	18-25	26-33	33-40	41-47	48-55	56-63	64+	
	☐	☐	☐	☐	☐	☐	☐	
Years Employed	1-5	6-10	11-15	16-20	20-25	26+		
	☐	☐	☐	☐	☐	☐		

	Strongly Disagree	Disagree	Moderately Disagree	Neither Agree or Disagree	Moderately Agree	Agree	Strongly Agree
1. I have a good sense of why I have certain feelings most of the time	☐	☐	☐	☐	☐	☐	☐
2. I always know my friends emotions from their behavior.	☐	☐	☐	☐	☐	☐	☐
3. I always set goals for myself and then try to do my best to achieve them.	☐	☐	☐	☐	☐	☐	☐
4. I am able to control my temper and handle emotions rationally.	☐	☐	☐	☐	☐	☐	☐
5. I have a good understanding of my own emotions.	☐	☐	☐	☐	☐	☐	☐
6. I am a good observer of others' emotions.	☐	☐	☐	☐	☐	☐	☐
7. I always tell myself I am a competent person.	☐	☐	☐	☐	☐	☐	☐
8. I am quite capable of controlling my own emotions.	☐	☐	☐	☐	☐	☐	☐
9. I really understand what I feel.	☐	☐	☐	☐	☐	☐	☐
10. I am sensitive to the feelings and emotions of others.	☐	☐	☐	☐	☐	☐	☐
11. I am a self-motivated person.	☐	☐	☐	☐	☐	☐	☐
12. I can always calm down quickly when I get angry.	☐	☐	☐	☐	☐	☐	☐
13. I always know whether or not I am happy.	☐	☐	☐	☐	☐	☐	☐
14. I have a good understanding of the emotions of people around me.	☐	☐	☐	☐	☐	☐	☐
15. I would always encourage myself to try my best.	☐	☐	☐	☐	☐	☐	☐
16. I have good control of my emotions.	☐	☐	☐	☐	☐	☐	☐
Job Demands To Perform my job well, it is necessary for me to:							
1. Spend most of my work interacting with people	☐	☐	☐	☐	☐	☐	☐
2. Spend a lot of time with every person I work with.	☐	☐	☐	☐	☐	☐	☐
3. Hide my actual feelings when acting and speaking with people.	☐	☐	☐	☐	☐	☐	☐
4. Be considerate and think from the point of view of others.	☐	☐	☐	☐	☐	☐	☐
5. Hide my negative feelings. (e.g., anger and depression)	☐	☐	☐	☐	☐	☐	☐

APPENDIX D
EMOTIONAL INTELLIGENCE CONSTRUCTS

Emotional Intelligence Construct Descriptions Linked to Survey Items

Construct Descriptions	Items Addressing Construct
Self-emotion appraisal: Individuals' ability to understand their deep emotions and to be able to express these emotions naturally.	1, 5, 9, 13
Others Emotion appraisal: Individuals' ability to perceive and understand the emotions of those people around them.	2, 6, 10, 14
Use of Emotion: Individuals' ability to make use of emotions by directing them towards constructive activities and personal performance	3, 7, 11, 15
Regulation of emotion: Individual's ability to regulate their emotions.	4, 8, 12, 16

APPENDIX E WILKS LAMBDA MULTIVARIATE TEST RESULTS

Wilks Lambda Multivariate Test Results

Effect	Value	F	Hypothesis df	Error df	Sig	Partial Eta Squared
Time	.527	4.230(a)	7.000	33.000	.002	.473
Time * Gender	.870	.707(a)	7.000	33.000	.666	.130
Time * Race	.357	1.424	28.000	120.405	.098	.227
Time * Age	.610	1.321(a)	14.000	66.000	.219	.219
Time * Yrsemp	.717	.852(a)	14.000	66.000	.612	.153
Time * Position	.599	.886	21.000	95.308	.609	.157
Time * Gender * Race	1.000	.(a)	.000	36.000	.	.
Time * Gender * Age	.722	.832(a)	14.000	66.000	.633	.150
Time * Race * Age	.961	.192(a)	7.000	33.000	.985	.039
Time * Gender * Race * Age	1.000	.(a)	.000	36.000	.	.
Time * Gender * Yrsemp	.549	1.646(a)	14.000	66.000	.090	.259
Time * Race * Yyrsemp	.746	1.607(a)	7.000	33.000	.168	.254
Time *Gender * Race *Yrsemp	1.000	.(a)	.000	36.000	.	.
Time * Age * Yrsemp	.716	.559	21.000	95.308	.936	.105
Time * Gender * Race * Age * Yrsemp	1.000	.(a)	.000	36.000		
Time * Gender * Age *Yrsemp	.927	.372(a)	7.000	33.000	.912	.073
Time * Race * Age * Yrsemp	1.000	.(a)	.000	36.000	.	.
Time * Gender * Position	.519	1.165	21.000	95.308	.300	.196
Time * Race * Position	.549	1.649(a)	14.000	66.000	.089	.259
Time * Gender * Race * Position	1.000	.(a)	.000	36.000	.	.
Time * Age *Position	.607	.509	35.000	141.248	.989	.095
Time * Gender * Age * Position	1.000	.(a)	.000	36.000	.	.
Time * Race * Age * Position	1.000	.(a)	.000	36.000	.	.
Time * Gender * Race * Age * Position	1.000	.(a)	.000	36.000	.	.
Time * Yrsemp * Position	.458	.823	35.000	141.248	.745	.145
Time * Gender * Yrsemp * Position	1.000	.(a)	.000	36.000	.	.
Time * Race * Yrsemp * Position	1.000	.(a)	.000	36.000	.	.
Time * Gender * Race * Yrsemp * Position	1.000	.(a)	.000	36.000	.	.
Time * Age * Yrsemp * Position	.920	.201(a)	14.000	66.000	.999	.041
Time * Gender * Age * Yrsemp * Position	1.000	.(a)	.000	36.000	.	.
Time * Race * Age * Yrsemp * Position	1.000	.(a)	.000	36.000	.	.

a Exact statistic

b The statistic is an upper bound on F that yields a lower bound on the significance level.

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